BAYDELTA CONSERVATIONPLAN

Environmental Impact Report/Environmental Impact Statement

HIGHLIGHTS

December 2013

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OVERVIEW

Introduction

The *Bay-Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement Highlights* provides a high-level overview of the BDCP Draft Environmental Impact Report/Environmental Impact Statement (Draft EIR/EIS). It is intended to acquaint the reader with the contents of the Draft EIR/EIS, and help the reader navigate that multi-volume document. The EIR/EIS Highlights is not part of the Draft EIR/EIS or the Draft Bay-Delta Conservation Plan.

The Delta

The Sacramento-San Joaquin River Delta (Delta) serves as a critical link in the state's water delivery system, and is an important ecosystem for hundreds of fish and wildlife, many of which are unique to the region. A number of Delta species are threatened or endangered. Water that moves through the Delta is delivered to 25 million Californians in the San Francisco Bay Area, the Central Valley, and Southern California and supports California's $30 billion agricultural industry, which produces much of the nation's domestically grown produce. The Delta and its waterways also provide transportation corridors, support extensive infrastructure, and offer recreational opportunities, including fishing, boating, birding, and hunting.

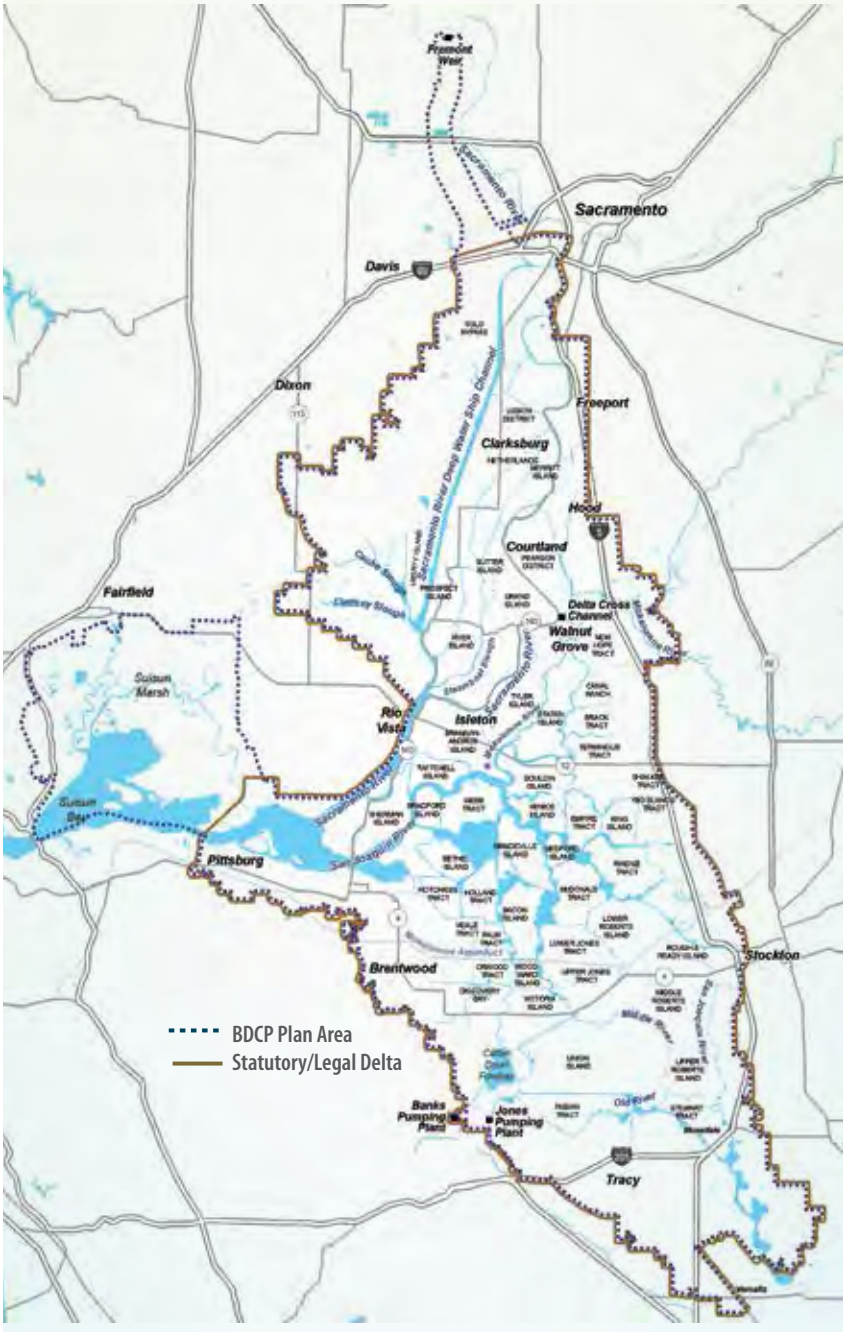
The Delta is the critical link in the state's water delivery system. About half of California's annual streamflow passes through the Delta. The natural flows in the Delta have been altered by a system of man-made levees, reservoirs, dredged waterways, and the operations of the State Water Project (SWP) and the Central Valley Project (CVP). The system as currently designed and operated is not sustainable from either an environmental or economic perspective. There is an urgent need to improve the conditions for threatened and endangered fish species in the Delta, and to improve the conveyance system to meet demands and address risks to water supply reliability, water quality, and the aquatic ecosystem. Appendix 1A of the Draft EIR/EIS provides background on the Delta and its development, issues facing the Delta, and efforts to address problems.

The BDCP

The proposed Bay Delta Conservation Plan (BDCP) is a comprehensive conservation strategy that intends to address the critical issues in the Delta using an ecosystem-based approach. The Plan would help to restore fish and wildlife species in the Delta and to improve reliability of water supplies, while minimizing impacts on Delta communities and farms.

The BDCP is a Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) developed in compliance with the federal Endangered Species Act (ESA) and the California Natural Community Conservation Planning Act (NCCPA). It is a planning document, to be implemented over 50 years, that describes the proposed actions to conserve and protect habitat and species in the Delta, reduce adverse effects of water diversions, and provide a more reliable water supply. Development of the BDCP is consistent with state and federal environmental protection laws associated with operation of the State Water Project (SWP) and Central Valley Project (CVP).

The BDCP and its environmental review intends to reflect the goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009. The requirements of the Delta Reform Act are described in Appendix 31 of the Draft EIR/EIS.



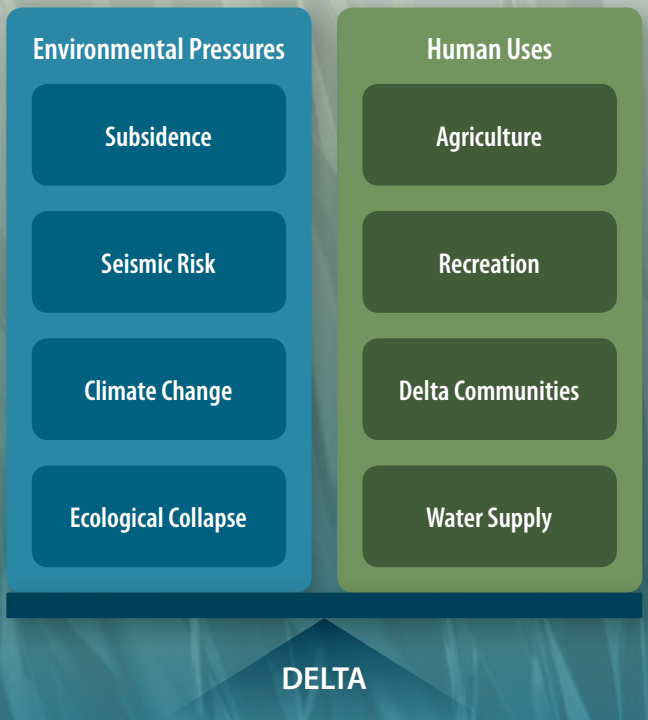
The BDCP Plan Area includes the Statutory, or legal Delta, as well as parts of Suisun Marsh and the Yolo Bypass where conservation measures would be implemented.

Conservation Measures

The BDCP consists of 22 Conservation Measures (CMs): a water conveyance component (CM1), conservation components (CM2–CM11), components related to reducing aquatic stressors (CM12–CM21), and avoidance and minimization measures (CM22).

CM1 involves construction of new water conveyance facilities and their operations. CM2 through CM11 describe habitat protection, restoration, and enhancement activities that would be implemented across the BDCP Plan Area over the 50-year permit term. These measures include enhancement of fish habitat in the Yolo Bypass; protection of existing natural communities, including cultivated lands; channel margin enhancement; and restoration of various habitat types, including tidal and nontidal wetlands, seasonally inundated floodplains, riparian habitat, grassland, and vernal pool complexes.

Balancing Delta Pressures and Uses



Changes in environmental conditions or human uses shift the balance in the Delta.

BDCP Goals for Restored and Protected Habitat—

Approximately 153,000 acres

New Floodplain
10,000 acres

Tidal Habitat
65,000 acres

Channel Margin Enhancement
20 levee miles

Riparian Habitat
5,000 acres

Grassland Habitat
10,000 acres

Other Habitats Protection and Restoration
5,000 acres

Managed Wetlands Protection and Restoration
8,000 acres

Cultivated Lands Protection
>45,000 acres

Incidental Take Permits

The BDCP proponents are applying for incidental take permits from USFWS and NOAA, and incidental take authorization by the California Department of Fish and Wildlife (DFW). The permits would authorize take – defined as actions that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct -- of certain state- and federally listed species, fully protected species, and some nonlisted species (collectively, covered species) during the course of otherwise lawful activities (i.e., covered activities).

The Environmental Review Process

While conservation plans like the BDCP are meant to be beneficial to the environment, specific plan actions can have environmental impacts on both the natural (biological) and human environment that must be evaluated, and actions must be identified to ease, or mitigate, those impacts. State and federal environmental laws require a review of potential environmental impacts of the BDCP before it can be approved and implemented. The BDCP Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The Draft EIR/EIS is intended to analyze and disclose the potential impacts on the human environment from the proposed action and alternatives.

The Draft EIR/EIS considers 15 action alternatives, including the proposed BDCP, and one no-action alternative. The alternatives analyzed in the draft EIR/EIS include a combination of water conveyance configurations, capacities and operational criteria; conservation measures that include habitat restoration and conservation targets and stressor reduction measures; and various avoidance and minimization measures. These alternatives were informed by public scoping sessions conducted in 2008 and 2009, the Sacramento–San Joaquin Delta Reform Act, and input from cooperating agencies and public comment.

The Draft BDCP, Draft EIR/EIS, and supporting documentation will inform decision making, including decisions by the state government whether to adopt BDCP, and decisions by the state and federal government of whether to issue endangered species permits.

Public Participation

Opportunities for public participation are ensured at various steps in the environmental review process under both CEQA and NEPA. A total of 22 scoping meetings were held throughout California in 2008 and 2009 to assist the lead agencies preparing the Draft EIR/EIS in identifying the topics the document should address.

Who's Involved

The environmental review process for the BDCP and its alternatives is being conducted by four state and federal agencies.

- **California Department of Water Resources (DWR)**
- **Bureau of Reclamation (Reclamation)**
- **U.S. Fish & Wildlife Service (USFWS)**
- **National Oceanic and Atmospheric Administration (NOAA) Fisheries**

Additionally, the Draft EIR/EIS has been developed in coordination with more than a dozen federal, state, and local resource agencies participating in a cooperating or coordinating capacity. These agencies have reviewed the Draft BDCP and alternatives in fulfillment of multiple local, state, and federal permitting requirements.

The environmental review process has the following key objectives:

- Identify environmental impacts.
- Identify economic impacts.
- Evaluate reasonable alternatives that could avoid or minimize those impacts.
- Develop mitigation (ways to reduce or avoid environmental impacts).
- Provide information for public review and comment.
- Disclose to decision makers the project impacts, mitigation, and public comments.

State Law

California Environmental Quality Act (CEQA)
Environmental Impact Report (EIR)

California Natural Community Conservation Planning Act (NCCPA)
Natural Community Conservation Plan (NCCP)

Federal Law

National Environmental Policy Act (NEPA)
Environmental Impact Statement (EIS)

Federal Endangered Species Act (ESA)
Habitat Conservation Plan (HCP)

Other opportunities for public involvement throughout the development of the BDCP and the Draft EIR/EIS included more than 600 public, working group, and stakeholder meetings and webinars. Additionally, the BDCP website (www.BayDeltaConservationPlan.com) has been updated on a regular basis with information about upcoming meetings and documents of interest, including publication of preliminary draft chapters of the Draft EIR/EIS in 2011, 2012, and 2013. Chapter 32, *Public Involvement, Consultation, and Coordination* in the Draft EIR/EIS provides detailed information on the public involvement process.

The Environmental Document

The BDCP Draft EIR/EIS provides comprehensive review and analysis of the following.

- Operational requirements, including a range of flows necessary for recovering the Delta ecosystem and restoring fisheries under a range of hydrologic conditions.
- A reasonable range of Delta conveyance alternatives.
- The effects of climate change and resulting sea level rise, and changes in precipitation and runoff patterns.
- The effects on migratory fish and aquatic resources.
- The effects on Sacramento River and San Joaquin River flood management.
- The resilience and recovery of Delta conveyance alternatives in the event of catastrophic loss caused by earthquake, flood, or other natural disaster.
- The effects of Delta conveyance alternatives on water quality.
- Addition of terrestrial habitat restoration, protection, and enhancement.
- Analysis of the built environment; e.g., land use, energy, utilities, public services, and agriculture.

How to Navigate the Draft EIR/EIS

The BDCP Draft EIR/EIS is comprised of 35 chapters, as well as technical data and studies presented in technical appendices. Additional appendices were included that respond to questions regarding water storage, water demand management, and seismic risk issues, among others. All appendices are listed in Chapter 1.

Chapters 5 through 30 are organized into the following sections.

- **Environmental Setting/Affected Environment** describes the existing conditions used for determining the impacts of BDCP and its alternatives under CEQA and NEPA.
- **Regulatory Setting** describes the laws, regulations, and policies that affect the resources or the assessment of impacts on the resources.
- **Environmental Consequences** describes the methods used to identify and assess the potential direct, indirect, and cumulative impacts, discloses the impacts associated with each of the proposed alternatives, and presents mitigation and other commitments to address those impacts.

Project Area and Plan Area[1]

The geographic areas evaluated in the Draft EIR/EIS consist of three regions.

- Upstream of the Delta region: areas that may be affected by the BDCP alternatives.
- Plan Area: includes the statutory, or legal, Delta, Suisun Marsh and the Yolo Bypass north of the statutory Delta.
- The SWP and CVP water supply export service areas.

The statutory Delta includes parts of Yolo, Solano, Contra Costa, San Joaquin, and Sacramento counties. Conservation measures under all alternatives would be implemented in the Plan Area.

The areas analyzed vary by resource topic and are defined in each resource chapter. For example, the study area (area in which impacts may occur) for the water supply analysis includes the Plan Area (the area covered by the BDCP and its alternatives); areas upstream of the Delta that may experience changes in operations as a result of implementation of the BDCP or its alternatives; and the SWP and CVP export service areas.

Chapters 1-4 Background & Approach	The Plan Area and Project Area, The Purpose and Need for Proposed Action, Alternatives to Address the Purpose and Need, and The Analytical Approach
Chapters 5-28 Resource Topics	Environmental Setting/Affected Environment, Regulatory Setting , and Environmental Consequences
Chapters 29-32 Other Considerations	Climate Change, Growth Inducement, Other CEQA/NEPA Required Sections, and Public Outreach Efforts
Chapters 33-35	Document Preparers, References, and Glossary
Appendices	Primer on California Water, Technical Data, and Studies

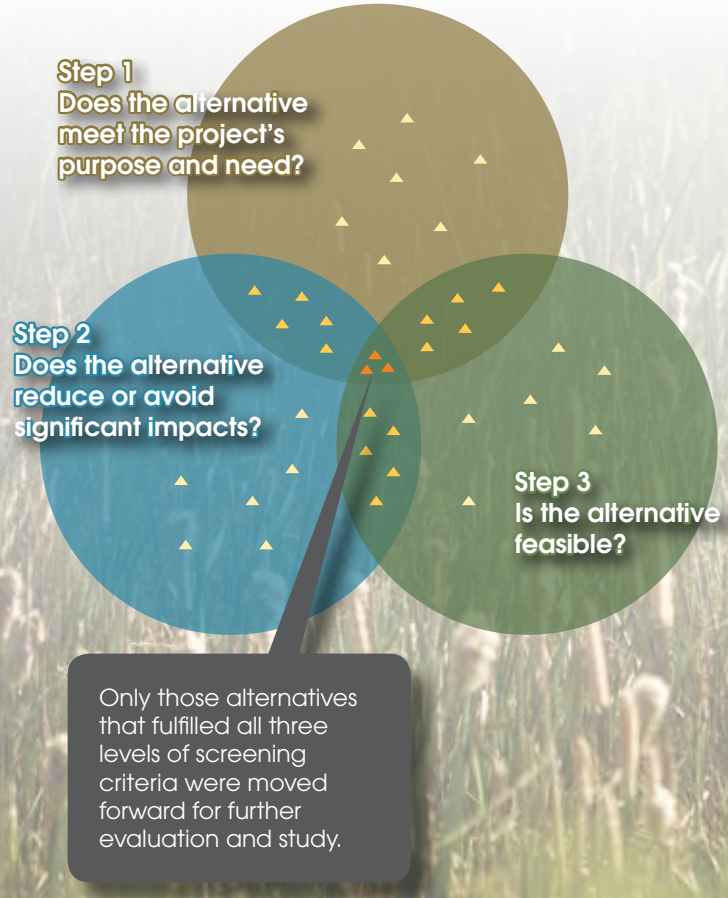
[1] There are two small Areas of Additional Analysis that were analyzed in Alternatives 1C, 2C, 6C and 4 because they might be used as power transmission corridors.

Alternatives

To satisfy CEQA and NEPA requirements, the state and federal lead agencies are required to study and make available for public review and comment a reasonable range of alternatives for consideration that meet the project's purpose and need. Accordingly, more than 100 alternative solutions were considered in the EIR/EIS process. The CEQA proposed project/ preferred alternative (Alternative 4), 14 action alternatives, and the No Action (NEPA) or No Project (CEQA) Alternative described and analyzed in the Draft EIR/EIS were developed over a 6-year period in collaboration with DWR, Reclamation, state and federal fish and wildlife agencies, state and federal water contractors, nongovernmental organizations, agricultural interests, and the general public.

The alternatives were selected using a multi-step screening selection process, including consideration of the responsible and cooperating agencies' comments during scoping and on preliminary draft documents. Alternatives were also screened against the Sacramento–San Joaquin 2009 Delta Reform Act requirements to ensure compliance with Water Code Section 85320. Appendix 3A in the EIR/EIS provides detailed information about alternatives screening.

In order to meet the project's purpose and need, all action alternatives include some type of new water conveyance facilities. New water conveyance facilities would be constructed in the Delta and operated in conjunction with existing SWP and CVP facilities. Five basic alignments are being considered for these new facilities: Pipeline/Tunnel, Modified Pipeline/ Tunnel, East, West, and Through Delta/Separate Corridors. Continued use of the through-Delta system as a complement to the new facilities is referred to as dual conveyance; reliance on new intake facilities alone is called isolated conveyance. Operation of these facilities would be governed by detailed criteria across a range of hydrological conditions defined by one of eight operational scenarios.



Alternative 4

Alternative 4 is the Proposed Project (the proposed BDCP) and DWR's "Preferred Alternative" for purposes of CEQA. It is consistent with the proposed BDCP published concurrently with the Draft EIR/EIS. Over the course of preparing the environmental analyses, Alternative 4 was refined and improved to identify a form of the proposed BDCP (Proposed Project) that is grounded in solid science and reaches what DWR considers to be an optimal balance between ecological and water supply objectives. Identification of Alternative 4 as the preferred CEQA alternative is tentative, and is subject to change as DWR and its partner lead and responsible agencies receive and consider public and agency input on the Draft EIR/EIS. It is therefore possible that the final version of the BDCP may differ from Alternative 4 as described in the Draft EIR/EIS, either because Alternative 4 itself was further refined, because another alternative was determined to be preferable, or because the Lead Agencies, in response to input, developed a new alternative with some features from some existing alternatives and other features from other existing alternatives.

Overview of Alternatives

The CEQA proposed project (Alternative 4), 14 action alternatives, and the No Action (NEPA) or No Project (CEQA) Alternative are described and analyzed in the BDCP Draft EIR/EIS. Each alternative includes conservation components such as creation and restoration of habitat for covered species, activities to reduce other stressors such as water quality improvements, and reduction of predation. These habitat measures are largely the same across action alternatives, except for Alternatives 5 and 7, which have different conservation targets. Under NEPA, the No Action Alternative describes future conditions that would occur without BDCP action alternatives (see baseline discussion on pages 11-13). Each action alternative includes combinations of the 22 BDCP conservation measures; various configurations of the water conveyance facilities; guidelines for operations; habitat restoration and conservation activities; various avoidance and minimization measures; and strategies to reduce other stressors on the Delta. CM12 through CM22—actions that would address and control contaminants, nonnative invasive species, predation, and other potentially important stressors on covered species—do vary across the action alternatives evaluated in the Draft EIR/EIS.

Alternative	Alignment Option [a]	Conveyance Type [a]	Intake Locations [b]	North Delta Diversion Capacity
No Action/ No Project	n/a	Through-Delta	n/a	Current Operations
Alternative 1A	Pipeline/Tunnel	Dual	1-5	15,000 cfs
Alternative 1B	East Canal	Dual	1-5	15,000 cfs
Alternative 1C	West Canal	Dual	W1 - W5	15,000 cfs
Alternative 2A	Pipeline/Tunnel	Dual	1-3, 6, 7, or 1-5	15,000 cfs
Alternative 2B	East Canal	Dual	1-3, 6, 7, or 1-5	15,000 cfs
Alternative 2C	West Canal	Dual	W1 - W5	15,000 cfs
Alternative 3	Pipeline/Tunnel	Dual	1&2	6,000 cfs
Alternative 4	Modified Pipeline/Tunnel	Dual	2,3&5	9,000 cfs
Alternative 5	Pipeline/Tunnel	Dual	1	3,000 cfs
Alternative 6A	Pipeline/Tunnel	Isolated	1-5	15,000 cfs (no direct diversions from South Delta Channels)
Alternative 6B	East Canal	Isolated	1-5	15,000 cfs (no direct diversions from South Delta Channels)
Alternative 6C	West Canal	Isolated	W1 - W5	15,000 cfs (no direct diversions from South Delta Channels)
Alternative 7	Pipeline/Tunnel	Dual	2,3&5	9,000 cfs
Alternative 8	Pipeline/Tunnel	Dual	2,3&5	9,000 cfs
Alternative 9	Through-Delta Separate Corridor	Through-Delta	Delta Cross Channel and Georgiana Slough channel modifications	15,000 cfs

[a] Alignment and conveyance options may include a combination of isolated and/or pipeline/tunnel and canal features that may be lined, unlined, and located east, west, through or under the Delta.

[b] Intake locations are analyzed for maximum impacts and may be refined. More information is provided in Appendix 3F. See map on page 10 for intake locations.

The table below provides an overview of the characteristics of the alternatives. Depending on the alternative selected, the maximum north Delta diversion capacity would range from 3,000 to 15,000 cubic feet per second (cfs).

As the table shows, the action alternatives share many components. For example, Alternatives 1B, 2B, and 6B all use the East Canal alignment, and almost all the physical components—such as diversion capacity and the primary conveyance facilities—are the same. However, each of these alternatives would follow a different set of guidelines for water operations. Alternative 2B includes a more restrictive set of guidelines for south Delta channel flows than the other two alternatives. Alternative 6B would be operated differently than Alternative 1B because it would no longer use the existing south Delta intake facilities. Similarly, Alternatives 2A, 2B, and 2C are identical in terms of their operational components; however, each alternative's physical components would involve a different alignment. Under Alternative 2A, the Pipeline/Tunnel and Canal alignment would be constructed, while Alternatives 2B and 2C would use the East and West Canal alignments, respectively.

Operational Scenario	Habitat Restoration [c]
n/a	n/a
A	Approximately 153,000 acres of restored and protected habitat (see below)
A	
A	
B	
B	
B	
A	
H	
C	Approximately 113,000 acres of restored and protected habitat
D	Approximately 153,000 acres of restored and protected habitat (see below)
D	
D	
E	Approximately 163,000 acres of restored and protected habitat; 20 additional miles of Channel Margin Habitat
F	Approximately 153,000 acres of restored and protected habitat
G	

[c] The BDCP planning process is working with various stakeholders to define more specific habitat restoration measures. These individual restoration projects may be the subject of separate, site-specific environmental review processes as the BDCP or an alternative is approved and implemented.

Water Operations Scenarios

Scenario A (Alternatives 1A, 1B, 1C, 3) establishes specific criteria guiding operations at a variety of locations and facilities. These criteria include north Delta diversion bypass flows; south Delta channel flows; Fremont Weir/Yolo Bypass operations; Delta Cross Channel gate operations; Rio Vista minimum instream flows; Delta inflow and outflow; Delta water quality and residence time; and in-Delta agricultural, municipal, and industrial water quality requirements detailed in D-1641, the SWRCB permit of the State Water Project.

Scenario B (Alternatives 2A, 2B, 2C), in addition to the south Delta modifications from Scenario A, includes an operable barrier at the Head of Old River, Fall X2, and additional south Delta protections.

Scenario C (Alternative 5) adopts the operational guidelines of Scenario A north of the Delta. South of the Delta, this scenario would be consistent with the existing 2008 and 2009 Biological Opinions.

Scenario D (Alternatives 6A, 6B, 6C) is modified from Scenario A to eliminate use of south Delta intakes and add criteria surrounding Fall X2.

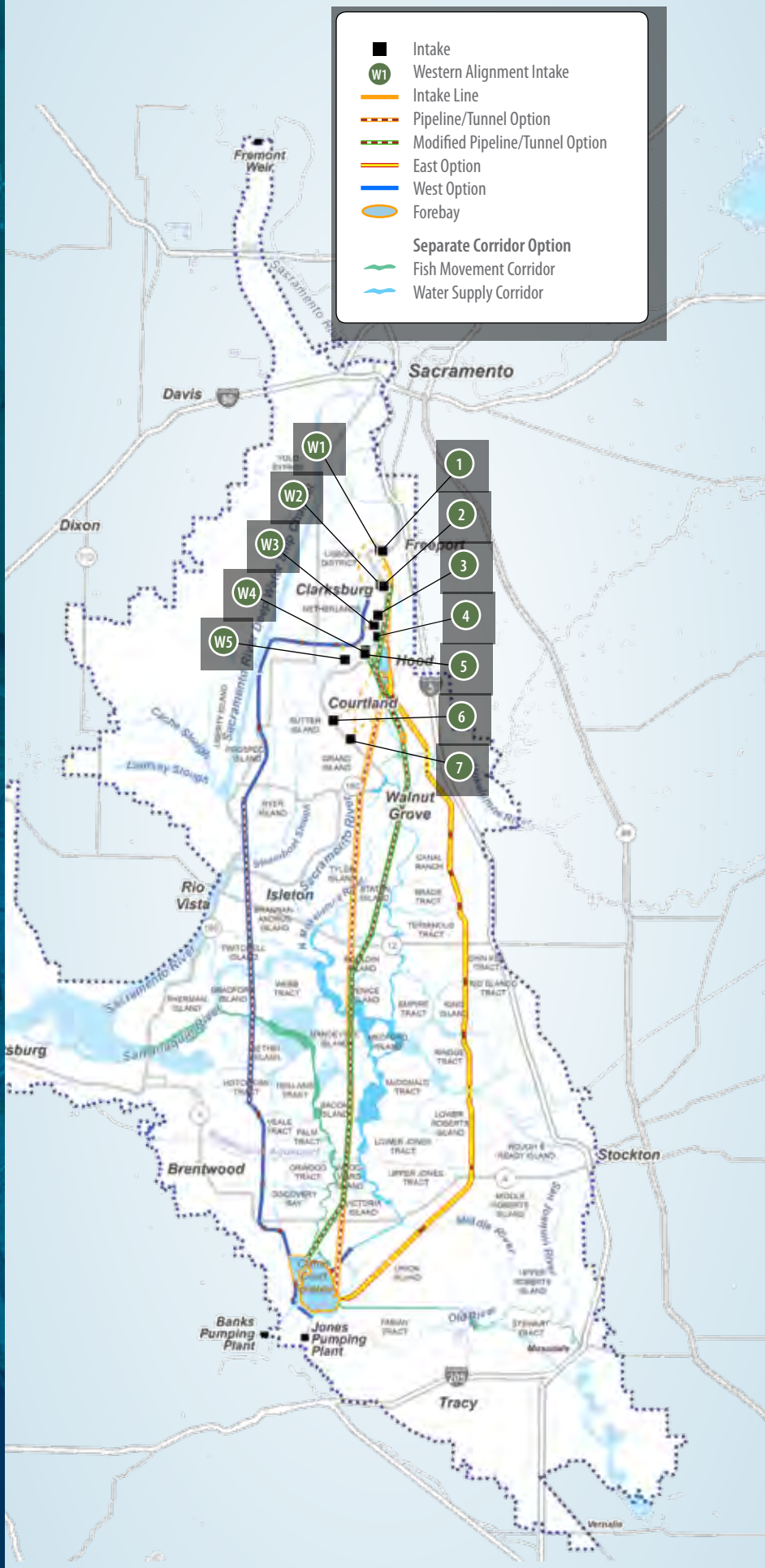
Scenario E (Alternative 7) is modified from Scenario A to increase north Delta diversion bypass flow and includes other modifications to south Delta channel flow criteria, Fremont Weir operations, Rio Vista minimum instream flow criteria, and Delta inflow and outflow criteria.

Scenario F (Alternative 8) increases Delta outflow up to 1.5 million acre-feet annually, as requested by the State Water Resources Control Board and other interest groups.

Scenario G (Alternative 9) is similar to Scenario B, but would be modified to conform to the conveyance components of the Through Delta / Separate Corridors option.

Scenario H (Alternative 4) is modified from Scenario A to include the decision tree process and CM1 operations. This is the operational scenario included in the Proposed Project (Alternative 4) under CM1.

More information on the Operations Scenarios, including the Decision Tree process and adaptive management, is provided in Chapter 3 of the Draft BDCP.



Project-Level and Program-Level Analysis

The Draft BDCP EIR/EIS alternatives are evaluated at two levels of detail: program-level and project-level. Program level analysis is appropriate when evaluating a series of actions that can be characterized as one large project, such as for an NCCP. Project-level analysis focuses primarily on the changes in the environment that would result from implementation of the BDCP or an alternative. The Draft EIR/EIS examines all phases, including planning, construction, and operations and maintenance.

The broad environmental effects of CM2 through CM22 are evaluated at the program level. The impacts, benefits, and mitigation measures presented in the Draft EIR/EIS for CM2 through CM22 are based on conceptual design information for the restoration and conservation strategies for aquatic and terrestrial habitat and other stressors. Some of these CMs would require additional environmental review before being implemented. For example, CM2, Yolo Bypass Fishery Enhancement, would require environmental analysis before operations to increase the frequency of floodplain inundation can begin.

The BDCP Draft EIR/EIS intends to provide project-level analysis for CM1, *Water Facilities and Operation*. The action alternatives have been evaluated with specificity regarding facility location, facility size, proposed mitigation, and water supply issues. The process for determining which CMs require more environmental review is described in Appendix 31A of the EIR/EIS.

Environmental Baseline

The purpose behind NEPA and CEQA is to disclose the possible beneficial or adverse impacts of the BDCP or one of its alternatives on the human environment. In order to measure the magnitude of any impact, agencies must first identify a baseline condition to serve as a point of impact comparison.

The BDCP joint Draft EIR/EIS satisfies the requirements of both NEPA and CEQA by considering two baselines. Appendix 3D in the EIR/EIS provides detailed information about existing conditions and identifying baseline conditions.

- The CEQA baseline standard normally requires a project to review its impacts relative to "change from existing conditions."
- The NEPA baseline standard allows a comparison of project impacts relative to future conditions without the project.

Conservation Measures

The BDCP Conservation Strategy consists of 22 Conservation Measures (CMs). CMs are organized into three distinct categories: landscape-scale, natural communities, and species specific. Conservation Measures are described in Chapter 3, *Conservation Strategy*, of the Bay Delta Conservation Plan.

Water Operations

CM1 Water Facilities and Operations

Natural Community Protection and Restoration

CM2 Yolo Bypass Fisheries Enhancement
CM3 Natural Communities Protection and Restoration
CM4 Tidal Natural Communities Restoration
CM5 Seasonally Inundated Floodplain Restoration
CM6 Channel Margin Enhancement
CM7 Riparian Natural Community Restoration
CM8 Grassland Natural Community Restoration
CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration
CM10 Nontidal Marsh Restoration
CM11 Natural Communities Enhancement and Management

Other Stressors

CM12 Methylmercury Management
CM13 Invasive Aquatic Vegetation Control
CM14 Stockton Deep Water Ship Channel Dissolved Oxygen Levels
CM15 Localized Reduction of Predatory Fishes
CM16 Non-Physical Fish Barriers
CM17 Illegal Harvest Reduction
CM18 Conservation Hatcheries
CM 19 Urban Stormwater Treatment
CM 20 Recreational Users Invasive Species Program
CM 21 Non-project Diversions
CM 22 Avoidance and Minimization Measures (AMMs)

AMMs are measures that would be implemented to avoid and minimize effects on covered species and natural communities that could result from implementing BDCP or its alternatives. AMMs are described in Appendix 3.C, *Avoidance and Minimization Measures*, of the Bay Delta Conservation Plan.

- AMM1 and AMM2 provide protections to all natural communities and covered species.
- AMM3-AMM9 focus primarily on protection of water bodies and covered fish.
- AMM10-AMM37 provide protections addressing the specific needs of covered plant or wildlife species and their associated natural communities.

Under CEQA, the project baseline normally consists of the existing environmental setting at the time the Notice of Preparation is published. Therefore, the CEQA analysis in this Draft EIR/EIS uses conditions as of February 2009 (referred to as Existing Conditions). Comparing the effects of the BDCP and its alternatives at 2060 (the anticipated time of full Plan implementation) with conditions in 2009 (Existing Conditions) may reveal effects not only from implementation of the project alternatives, but may also show the added effects of other reasonably foreseeable factors that are anticipated to occur over the next 50 years (e.g., climate change and sea level rise).

Under NEPA, every EIS is required to analyze a No Action Alternative, in addition to the range of action alternatives presented for study. The No Action Alternative describes those conditions that would exist in the absence of an alternative, including continuing programs or conditions in the future. Analysis of the No Action Alternative establishes a baseline for comparison to proposed action alternatives. The NEPA analysis presented in this document compares the effects of implementing BDCP or its alternatives in 2060 with the effects of the No Action Alternative in 2060. Since both conditions account for foreseeable factors in 2060, this analysis more accurately isolates the effects associated with implementation of the BDCP or its alternatives.

This difference between the CEQA and NEPA analyses is most easily seen in discussions of resources that are affected by climate change and sea level rise (e.g., water supply, surface water, water quality, fish and aquatic resources).

Impacts and Mitigation

The Draft EIR/EIS discloses the context and intensity of impacts for NEPA compliance, and the significance of impact for CEQA compliance in separate discussions. Relative to CEQA, a "significant effect on the environment" is defined as a substantial, or potentially substantial, adverse change in the environment. To facilitate both CEQA and NEPA review, each resource chapter describes potential impacts, significance of the impact (for CEQA), minimization and mitigation to reduce the significant impacts, and a statement of the impact significance before and after mitigation.

Throughout this Draft EIR/EIS, impacts are described as temporary or permanent. These terms apply differently to different resources and are defined, where relevant, in each resource chapter. In some cases, impacts are treated as permanent, even though the impact mechanism would end following construction of water conveyance facilities.

A *significant and unavoidable effect* on the environment is defined as a substantial, or potentially substantial, adverse change in the environment, for which no feasible mitigation measures are available to reduce the impact to a less-than-significant level.

The Draft EIR/EIS also addresses cumulative impacts on the environment that could result from implementation of a BDCP alternative in combination with other past, present, and reasonably foreseeable projects. Cumulative impacts can result from minor individual impacts that become significant when considered in combination with these other impacts.

Mitigation is specifically defined in this Draft EIR/EIS as measures used to reduce impacts described for each resource in Chapters 5 through 30. Specific mitigation measures are proposed when necessary to avoid, reduce, minimize, or compensate for environmental effects of the BDCP alternatives. CEQA requires that, whenever possible, agency decision makers adopt feasible mitigation to reduce significant environmental impacts to a less-than-significant level. Although NEPA does not impose a similar obligation on federal agencies, the development of specific mitigation measures is consistent with NEPA's intent that mitigation be discussed in sufficient detail to ensure that environmental consequences are fairly evaluated. The feasibility of mitigation is ultimately determined by agency decision makers.

Environmental commitments and best management practices are incorporated into the BDCP alternatives to avoid or minimize potential adverse impacts. Environmental commitments are described in Appendix 3B of the EIR/EIS.

Next Steps

Public Review of the Draft EIR/EIS

The release of the Draft EIR/EIS initiates a formal 120-day public review period. During this time, members of the public are encouraged to review the Draft EIR/EIS and provide comments related to the document. Comments received during the 120-day public review period will be considered during development of the Final EIS/EIR. All comments received on the Draft EIR/EIS will be considered in the Final EIR/EIS and decision-making process.

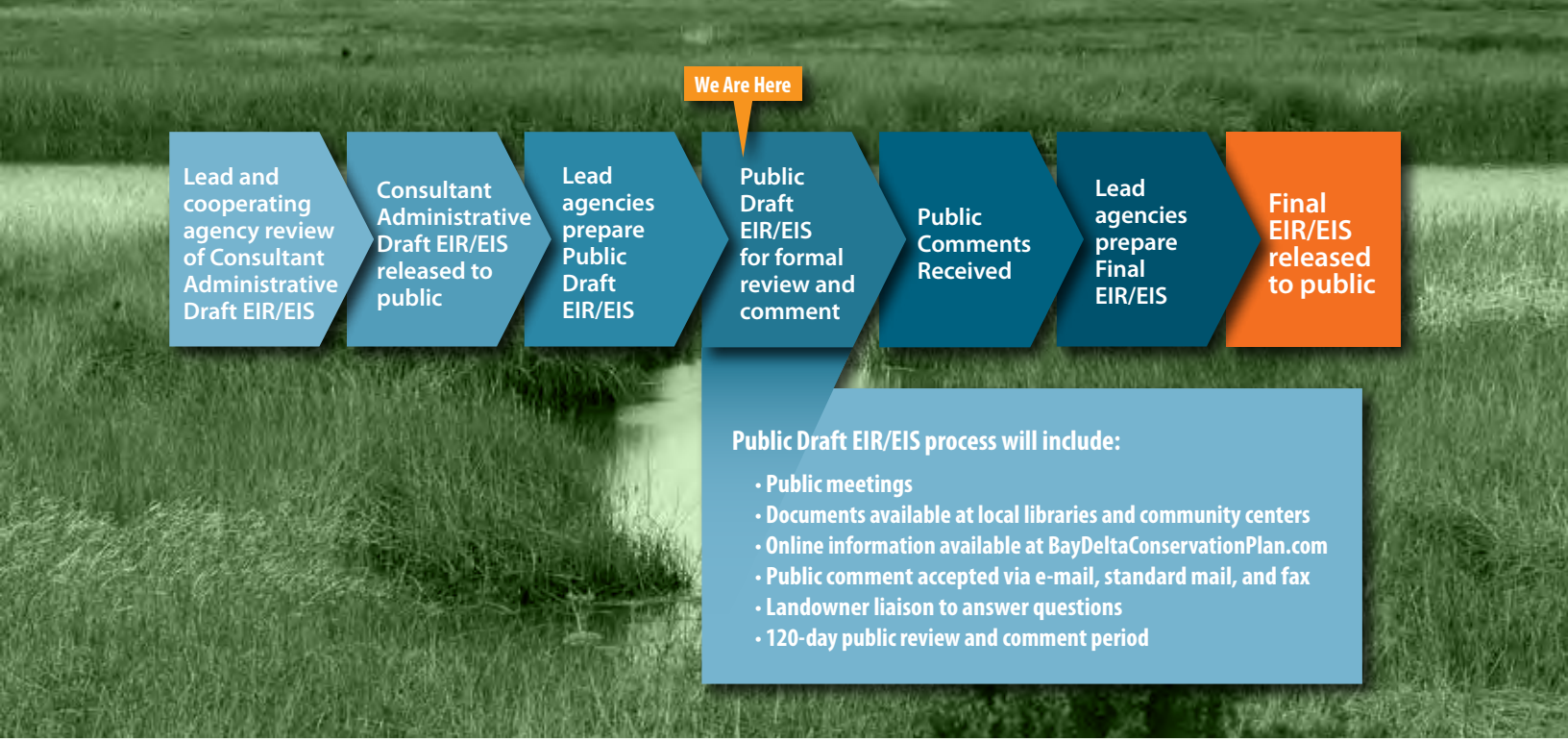
The Draft and Final EIR/EIS will be available for review at multiple locations.

- Lead Agency offices
  - California Department of Water Resources
  - Bureau of Reclamation
  - NOAA Fisheries
  - U.S. Fish and Wildlife Service
- Libraries
- Bay Delta Conservation Plan (*http://baydeltaconservationplan.com*)

How to Make Effective Comments

The Executive Summary is a good place to start with a review of the Draft EIR/EIS. The Executive Summary is intended to provide a general understanding of the alternatives and the resource issues. Each resource chapter provides in-depth analysis of the environmental setting, regulations, and potential impacts and proposed mitigation.

The following guidelines contribute to effective comments.



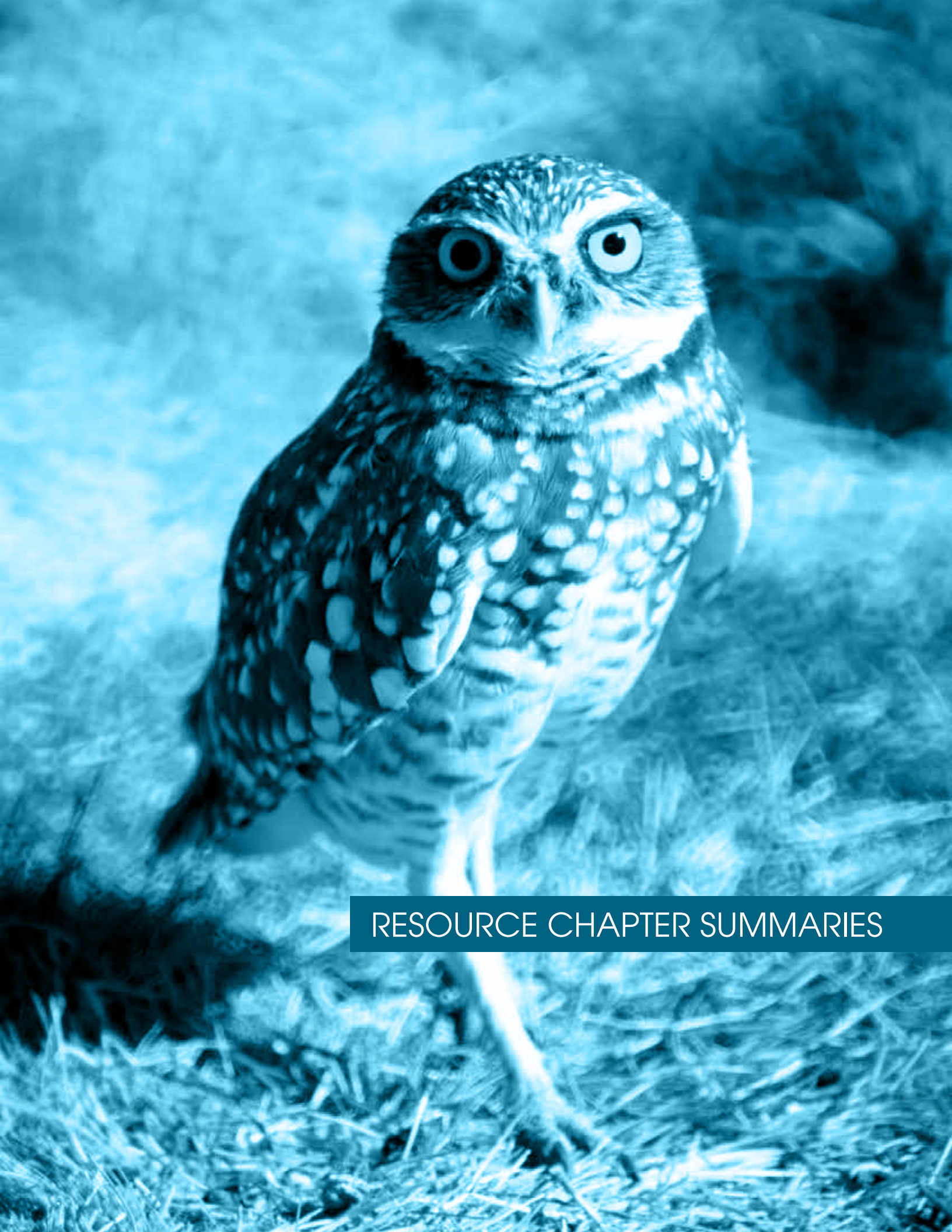
- Comments should be concise and focus directly on applicable portions of the Draft EIR/EIS or Draft BDCP.
- Comments should identify the specific part of the Draft EIR/EIS or Draft BDCP at issue and should include supporting evidence and facts.
- The commenter should provide complete references and/or citations, particularly when referring to websites (that is, provide a specific URL address, rather than simply citing "DWR web site").

Environmental Justice

As discussed in Chapter 28, *Environmental Justice*, of the Draft EIR/EIS, public outreach is central to the principles of environmental justice. During the document preparation process, public outreach activities were conducted that considered minority and low-income populations.

- Meetings were held in numerous locations to provide wide access and availability.
- Notification and announcements of scoping meetings were published in ethnic newspapers and communicated on ethnic radio stations.
- Scoping meetings within affected communities were held during evening hours in an effort to involve low-income and minority communities outside of working hours.
- Translators were provided at public scoping meetings.
- The BDCP website was made available in Spanish.
- A multilingual information hotline for project information was established in English, Spanish, Tagalog, Vietnamese, and Chinese (Mandarin).

Prior to the release of the Draft EIR/EIS, additional public outreach efforts were targeted to minority and low-income communities to make them aware of the document availability and contents. Activities included briefings with leaders of affected communities; translation of materials; notification of document availability in ethnic media; and posted notices in community centers, local libraries, and post offices, with contact information in various languages.



RESOURCE CHAPTER SUMMARIES

Water Supply

Chapter 5 describes the effects that implementing the BDCP or its alternatives would have on water supply conditions of the SWP and CVP. The chapter examines the water supply to SWP and CVP water users in the Plan Area, upstream of the Delta region, and the Export Service Areas, and potential changes associated with implementation of *CM1 Water Facilities and Operation* and other conservation measures. Appendix 1C of the EIR/EIS, describes water use efficiency programs being implemented by local water suppliers and communities.

Environmental Setting/ Affected Environment

Supply

California's water supply, which depends primarily on precipitation (both rain and snow), is highly variable across the state and from year to year. The majority of California's precipitation occurs between November and April, and in an average water year contributes about 200 million acre-feet (MAF) of water to California's water supply. However, that volume can be less than 100 MAF during a dry year and more than 300 MAF in a wet year. Moreover, more than half the precipitation evaporates, leaving about 40–50% available for urban, agricultural, and environmental uses. Most of the precipitation falls in the mountains in the northern half of the state. In some years, areas in the northern part of the state can receive 100 inches of precipitation or more, while the southernmost regions receive only a few inches. With climate change, the state's precipitation is expected to become even more unpredictable.

Much of the surface runoff—winter precipitation and spring snowmelt—is captured in surface water reservoirs to provide flood protection, water supply, and groundwater recharge. But the state's largest surface reserve of stored water is the Sierra Nevada snowpack, which holds about 15 MAF of water annually on average. In addition to surface water, groundwater resources exist throughout the Central Valley, the southeast desert, and in isolated basins on the coast. These basins and sub-basins have varying degrees of supply reliability in terms of yield, storage capacity, and water quality.

Demand

While most of California's precipitation falls during the winter months in the northern part of the state, most of the state's demand is in the dry summer months, in major population and agricultural centers to the south. Combined with unpredictable precipitation volumes, this creates challenges in managing the available runoff to meet these sometimes conflicting needs of urban, agricultural, and environmental uses. Public water agencies meet water demands primarily through an extensive network of water storage and conveyance facilities, groundwater development, and improvements in water use efficiency. Population growth is a major driver of demand. From 1990 to 2005, California's population increased from about 30 million to 36.5 million people. The state and federal water projects are operated to provide water for agricultural municipal, industrial, recreational, and environmental uses.

Another important factor contributing to water demand is the dedication of water to environmental needs. The Central Valley Project Improvement Act (CVPIA), state flow regulations and water quality objectives, as well as recent biological opinions (BiOps) developed by the USFWS (2008) and NOAA (2009), have resulted in the dedication of water to fish, wildlife, and habitat restoration needs. These requirements entail water releases from upstream reservoirs to meet in-river and Delta outflow criteria, among other actions.

Sea Level Rise and Climate Change

Climate change is anticipated to result in a decreased snowpack in coming years, as more precipitation falls as rain and less falls as snow. This shift would also lead to changes in peak runoff periods, causing higher flow potential in late winter and early spring, resulting in less runoff during the late spring and summer. These timing changes could result in reduced water supply availability in late spring and summer as well as warmer water temperatures in both rivers and reservoirs. Moreover, the potentially decreased river flows could affect salinity in Delta waterways. Sea level rise will push salt water further east into the Delta, requiring increased upstream water releases to push sea water out of the Delta and achieve in-Delta water quality standards. These operational changes would, in turn, decrease available water supply for south of Delta users.

Overview of Impacts and Mitigation

Operation of the BDCP or its alternatives could result in changes in CVP and SWP reservoir storage and river flows. Operations of water facilities owned or operated by other water rights holders would not be modified by construction of BDCP or its alternatives.

The BDCP and its alternatives do not include any regulatory actions that would reduce protections for water rights holders other than the SWP and CVP.

The analysis of the effects of the BDCP Draft EIR/EIS alternatives on water supply focuses on the following possible results of implementation.

- Change in Delta outflow
- Change in SWP and CVP reservoir storage
- Change in Delta exports
- Change in SWP and CVP deliveries
- Change in transfers

The analysis of effects related to water supply is very complex because it must examine a great many variables over time—and particularly because of the challenge of accounting for effects related to sea level rise and climate change. Accordingly, the analysis considered several sets of conditions and made several sets of comparisons. This issue is further complicated by the differing baseline standards of NEPA and CEQA.

- *Existing conditions* (CEQA) are the conditions at the time the NOP was issued—that is, 2009. These conditions do not include projections of future sea level rise and climate change (i.e., effects on precipitation and snowpack).
- *No Action Alternative* (NEPA) reflects the conditions projected to exist with climate change and without implementation of BDCP or its alternatives in 2060. The year 2060 represents an approximation of the end of the permit period that would apply to the BDCP.

- *Action Alternatives* reflect the conditions with implementation of the BDCP or its alternatives (Alternatives 1A through 9) in conjunction with sea level rise and climate change at 2060.

With these variables in mind, the analysis undertook the following comparisons to determine the magnitude of effects of implementing BDCP or its alternatives.

- Existing conditions were compared with the No Action Alternative. This analysis depicts the changes in water supply that would occur in the absence of implementing BDCP or its alternatives, but accounts for water supply effects of climate change and sea level rise.
- Existing conditions were compared with the action alternatives. This analysis compares the changes in water supply that would result from implementation of BDCP or its alternatives with the current conditions—with sea level rise and climate change taken into account.
- The No Action Alternative was compared with the action alternatives. This analysis compared the conditions in 2060 in the absence of BDCP implementation with the conditions in 2060 under each of the action alternatives, which accounts for changes in sea level and climate.

These analyses indicated that, in some cases, the amount of change in water supply between the present and 2060 caused by sea level rise and climate change would be greater than the change attributable to operational changes associated with implementing BDCP or its alternatives. Nevertheless, effects on water supply resources in the Project Area would be expected to result from changes in operations of both new and existing water facilities.

On average, modeling of BDCP Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4 (H1, H2, and H3), and 5 would not result in reductions in Delta exports or SWP and CVP deliveries, compared with conditions under the No Action Alternative. Modeling of BDCP Alternatives 4 (H4), 6A, 6B, 6C, 7, 8, and 9 would result in such reductions on average, compared with conditions under the No Action Alternative.

Surface Water

Chapter 6, *Surface Water*, examines the effects of implementing BDCP or its alternatives on surface waters in the Delta and upstream of the Delta. Other chapters that discuss surface water are Chapter 5, *Water Supply*, Chapter 7, *Groundwater*, and Chapter 8, *Water Quality*.

Environmental Setting/ Affected Environment

The study area for surface water comprises the Sacramento hydrologic region, the Delta, and Suisun Marsh, and is located at the confluence of the Sacramento and San Joaquin Rivers. Some SWP/CVP water supplies are conveyed in rivers and streams within the Sacramento River and San Joaquin River basins, affecting surface water flows in those basins. In other parts of the state, SWP/CVP water supplies are conveyed in pipelines and canals and do not directly affect surface waters. The surface water analysis addresses changes to surface waters that could result from modifications in SWP/CVP water supply operations in the Delta and upstream of the Delta, as well as from implementation of habitat restoration in the Plan Area.

Overview of Impacts and Mitigation

The analysis considered the types of potential effects listed below.

- Changes in reverse flow conditions in Old River and Middle River.
- Effects on flood management as a result of changes in water storage and flows.
- Assessed impacts associated with flooding.

The analysis in Chapter 6 identified the following impacts on surface water.

- Construction, operations, and maintenance of water conveyance facilities and conservation measures would alter drainage, stream courses, and runoff, potentially resulting in flooding. Mitigation measures would include installation of an on-site drainage system, a sediment management plan, and on-site stormwater detention storage, if needed, to limit runoff and sedimentation from the construction areas.
- Implementing alternatives would not substantially change reservoir flood storage or surface water flows.
- Increased wind fetch in areas of open water habitat restoration could cause potential damage to adjacent levees. Levees would be strengthened and possibly raised to avoid damage from waves or water on the landside of the levees. Other mechanisms to reduce the effects of wind fetch would be considered in the design of restoration areas.
- Some alternatives would provide benefits to water quality and aquatic resources by reducing reverse flows in Old and Middle River.

Groundwater

Chapter 7, *Groundwater*, examines the effects of implementing BDCP or its alternatives on groundwater resources. Other chapters that discuss groundwater are Chapter 5, *Water Supply*, and Chapter 8, *Water Quality*.

Environmental Setting/ Affected Environment

Groundwater provides about 35% of the state's water needs, and 40% or more during droughts. With the growing limitations on available surface water exported through the Delta, and the potential impacts of climate change, reliance on groundwater through conjunctive management would become increasingly important in meeting the state's future water uses.

For the purposes of this analysis, the groundwater study area specifically consists of the Plan Area, the Upstream of the Delta Region, and the SWP and CVP Export Service Areas. The study area overlies parts of several extensive groundwater basins. Groundwater and surface water intersect to varying degrees. For instance, rivers carrying spring snowmelt can recharge underlying groundwater aquifers; where the water table is shallow, rivers can receive groundwater inflow. During drought years, there may be increased reliance on groundwater supplies; aquifers are recharged when surface water supplies are more abundant.

Groundwater is used throughout the Delta for agricultural, municipal, and industrial needs. However, an accurate accounting is not available because wells that pump groundwater are not metered.

The state does not maintain a statewide groundwater management program. In recent years, legislation has provided guidelines and funding for local water agencies to develop groundwater management programs.

Overview of Impacts and Mitigation

The analysis examined the effects of implementing BDCP or its alternatives on groundwater resources, focusing on the potential effects listed below.

- Depletion of groundwater supplies or interference with groundwater recharge, causing a net deficit in aquifer volume or lowering the groundwater table so that wells would not support existing land uses or planned land uses for which permits have been granted.
- Degradation of groundwater quality, so that poor quality groundwater migrates into areas of higher quality groundwater.
- Interference with agricultural drainage in the Plan Area so that shallow groundwater levels rise and interfere with existing systems or require installation of new systems to allow for optimal crop growth; alteration of shallow groundwater flow directions, rendering existing drainage systems dysfunctional.

The analysis identified the following impacts on groundwater resources in the study area.

- Construction of water conveyance facilities (CM1) would potentially and temporarily reduce local groundwater levels or reduce production capacity of existing wells as a result of dewatering activities. As mitigation, a groundwater monitoring program would be implemented, and detected water supply losses would be offset to ensure that domestic and agricultural water supplies are maintained.
- Operations and maintenance of new facilities could interfere with agricultural drainage systems through a rise in groundwater levels. Where existing drainage system are not adequate, mitigation would be developed, including installation of new or improvement of existing drainage systems, as well as pumping to achieve suitable field conditions.
- Increased inundation of areas associated with the restoration of tidal habitat, channel margin habitat, and seasonally inundated floodplain habitat could result in groundwater level rises and increased seepage. This impact would be reduced by identifying areas where seepage conditions have worsened and installing additional subsurface drainage measures as needed. In some instances, however, mitigation may be infeasible due to factors such as cost for those properties.
- The potential for groundwater quality degradation beneath restoration areas is not known. Potential impacts would need to be addressed on a site-specific basis.

Appendix 1B of the EIR/EIS describes the potential for additional water storage in California, including groundwater, large system, and regional/local storage, although water storage is not a project component of the BDCP.

Water Quality

Chapter 8 describes the potential impacts of the BDCP and its alternatives on surface water quality in the study area—the Plan Area, upstream of the Delta region, and the SWP/CVP Export Service Areas. For additional discussions that relate to water quality, see Chapter 5, *Water Supply*, Chapter 6, *Surface Water*, and Chapter 7, *Groundwater*. There is also a Readers Guide to Chapter 8 in the EIR/EIS.

Environmental Setting/ Affected Environment

Water quality conditions are evaluated based on quantitative and qualitative assessments, some of which rely on water quality models, that account for water quality associated with the three major rivers in the north (Sacramento, Feather, and American Rivers), the tributaries from the east (Cosumnes, Mokelumne, and Calaveras Rivers), the San Joaquin River from the south (including its major tributaries), and San Francisco Bay water from the west. Modeling output was assessed at locations throughout the Delta that represent a range of geographic variability. Among the locations assessed are points where water is pumped out of the Delta (e.g., Harvey O. Banks Pumping Plant, C. W. "Bill" Jones Pumping Plant, Contra Costa Water District Pumping Plant #1, North Bay Aqueduct Pumping Plant).

Water quality in the BDCP study area is currently affected by land use patterns in the upstream watersheds, SWP and CVP operations, sea water intrusion, and in-Delta activities and pollutants.

Overview of Impacts and Mitigation

The surface water quality impact assessment addresses two key questions.

- Would implementation of the alternatives result in changes in water quality in the Plan Area?
- Would implementation of the alternatives result in beneficial effects on water quality in these areas?

The analysis of effects of implementing actions included in the BDCP and its alternatives on water quality considered the factors listed below.

- Evaluation of whether predicted changes in salinity would exceed the State of California's current allowable levels.
- Increased levels of bioaccumulative pollutants in aquatic organisms that would be expected to substantially increase the health risks to wildlife, fish, or humans consuming those organisms.
- Long-term degradation of water quality resulting in substantially increased risks for adverse effects on one or more beneficial uses.
- Further measurable degradation of water quality in water bodies that are already listed as impaired.

A *screening analysis* was performed to determine the possible water quality effects of implementing the BDCP EIR/EIS alternatives. First, the analysis determined which constituents had no potential to exceed the thresholds of significance and consequently did not warrant further assessment. The analysis then identified a list of *constituents of concern* that were further analyzed to assess

potential water quality–related impacts. Of the 182 water quality constituents/parameters evaluated, 110 were determined to have no potential to exceed the thresholds of significance, and 72 were carried forward for environmental analysis.

The BDCP EIR/EIS alternatives involve several factors that have the potential to affect water quality.

- Particularly in the west Delta, seawater intrusion caused by sea level rise or decreased Delta outflow (as a result of drought or lack of storage) can increase the concentration of salts. Conversely, Delta outflow can decrease the effects of seawater intrusion.
- With or without the BDCP or its alternatives, water quality conditions upstream of the Delta, in the Delta Region, and in the SWP/CVP Export Service Areas are expected to change as a result of past, present, and reasonably foreseeable future projects; population growth; climate change; and changes in water quality regulations.
- In the south, west, and interior Delta, a decrease in Sacramento River–sourced water and a concurrent increase in San Joaquin River–sourced water can increase the concentrations of numerous constituents (boron, bromide, chloride, electrical conductivity, nitrate, organic carbon, and some pesticides). The increases will not violate existing regulatory standards. This source water replacement would be a result of decreases in south Delta export pumping in some BDCP alternatives.

Operations and maintenance of water conveyance facilities (CM1) and implementation of other conservation measures could cause adverse in-Delta water quality affects for the following constituents of concern. The increases will not violate existing regulatory standards.

- Operations of water conveyance facilities could contribute increased concentrations of bromide at several Delta locations, especially during periods of increased seawater intrusion and drought. Following commencement of initial operations, additional evaluations and modeling would be conducted to define the extent to which modified operations could reduce or eliminate the increased bromide concentrations. Effectiveness of mitigation is uncertain, and this impact is considered not fully mitigated.
- Operations of water conveyance facilities could contribute to increased concentrations of chloride, causing

Constituents of Concern

Bromide: Inorganic ion that is a precursor to disinfection byproduct formation. The highest concentrations of bromide are found in Bay source water and, to a lesser degree, in San Joaquin River and Delta agricultural discharges.

Chloride: Inorganic ion that causes undesirable taste in drinking water and can affect aquatic life beneficial uses. The highest concentrations of bromide are found in Bay source water and, to a lesser degree, in San Joaquin River and Delta agricultural discharges.

Electrical Conductivity (EC): A measure of salinity (concentration of dissolved salts) in water. EC is highest in seawater, and is also elevated in San Joaquin River water.

Organic Carbon: Compounds containing carbon, including degraded plant/animal material, wastewater, urban runoff, and

degradation of municipal or agricultural water quality and exceedance of water quality objectives in the west Delta and some interior Delta locations. Following initial operations, feasible actions to reduce chloride levels would be initiated and evaluated to protect beneficial uses. Effectiveness of mitigation is uncertain, and this impact is considered not fully mitigated.

- Operations of water conveyance facilities could contribute to increased levels of electrical conductivity (EC), or salt, from seawater intrusion and increased inflow from the San Joaquin River. Potential reductions in irrigated lands in the Delta could lead to reduced discharges of agricultural field drainage with elevated levels of salt. Phased actions for reducing salt levels and potential adverse effects would be identified and evaluated. Effectiveness of mitigation to reduce all impacts is uncertain. In addition to mitigation measures, the BDCP proponents would make other commitments to address potential increased water treatment costs that could result from salt concentration effects on municipal, industrial, and agricultural water purveyor operations.
- Operations of water conveyance facilities and implementation of CM2 through CM22 could contribute to adverse effects on municipal water quality from organic carbon. The BDCP proponents would consult with Delta water purveyors to identify means to avoid, minimize, or offset increases in long-term average organic carbon concentrations, and could implement combinations of measures to maintain concentrations at existing levels in treated drinking water. Restoration projects would be located to minimize impacts on municipal intakes and maximize habitat benefits. Wetlands would be designed to decrease dissolved organic carbon loading, and construction of wetlands and channel margin / riparian sites would be staggered. It is uncertain, however, whether mitigation would fully reduce identified impacts.
- With the exception of CM 13, applications of pesticides related to the operations and maintenance of water conveyance facilities and implementation of other CMs would not present new or substantially increased sources of pesticides in the Plan Area. In the long term, implementation of conservation measures could possibly result in a limited reduction in pesticide use in the Delta through repurposing or fallowing agricultural lands for natural habitat purposes.

agricultural discharge. The San Joaquin River and Delta agriculture are major sources of organic carbon input into the Delta.

Pesticides: Chemical compounds used for the control of pests—insecticides, herbicides, fungicides, and so on. Incidence of organophosphate pesticides is generally higher in the San Joaquin River than in other source waters.

Mercury: A toxic trace metal that accumulates in aquatic plants and wildlife. Mercury loading is greatest in the Sacramento River and Yolo Bypass; concentrations are greatest from Eastside tributaries and the San Joaquin River.

Selenium: A trace metal that is essential at low levels but toxic at high levels. The highest concentrations are in the San Joaquin River; concentrations are elevated in the Sacramento River and Yolo Bypass.

Application of pesticides targeting invasive plants would be timed to minimize tidal dispersion and target invasive species at their most vulnerable times to reduce the need for repeat applications.

CM 13 proposes the use of herbicides to control invasive aquatic vegetation around habitat restoration sites; such use could have adverse effects on non-target aquatic species.

- Implementation of CM2 through CM4 (habitat restoration) could contribute to adverse effects from mercury in the Delta. Appropriate mercury and methylmercury control measures would be developed and implemented. See CM12 of the BDCP and Appendix 3B, *Environmental Commitments*. The effectiveness of minimization and mitigation actions in accordance with the mercury management plans is not known at this time, although the potential to reduce methylmercury concentrations exists based on current research, and no mitigation measures would be available until specific restoration actions are proposed.
- Operations and maintenance of water conveyance facilities under Alternative 9 and implementation of CM2 through CM4 could contribute to adverse effects from selenium. Before groundbreaking activities commence, an expert in selenium management would develop a comprehensive Selenium Monitoring and Management Plan, which would include adaptive management strategies. For each restoration project under CM4, a project-specific selenium management plan would be developed to prevent adverse effects.

Geology and Seismicity

Chapter 9, *Geology and Seismicity*, describes the existing geologic and seismologic conditions and associated potential geologic, seismic, and geotechnical hazards in the Plan Area. Near-surface soils are fully discussed in Chapter 10, *Soils*, which describes surface erosion, subsidence processes, and other soil hazards. Mineral resources that could be affected by construction and operation of the BDCP EIR/EIS alternatives are fully discussed in Chapter 26, *Mineral Resources*.

Environmental Setting/ Affected Environment

The geologic setting focuses on the subsurface soils and the underlying bedrock units, including existing natural levee and channel deposits.

The seismologic setting describes historical seismic events and the ground-shaking potential during earthquakes.

Geologic and seismic hazards, including surface fault rupture, seismic induced liquefaction, and slope instability and ground failure, are identified. Potential levee instability and breaches related to geologic processes that could result in flooding are also described. A full discussion of levee stability is presented in Chapter 6, *Surface Water*.

Overview of Impacts and Mitigation

The chapter also describes the potential effects that could result from project construction, operation, and restoration activities and maintenance in the context of geologic and seismic conditions and hazards. The types of effects that were evaluated are listed below.

- Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death.
- Areas that are unstable or could become unstable as a result of projects within the BDCP and its alternatives and result in on- or offsite landslide, subsidence, liquefaction, or collapse.

Seismic, geologic, and geotechnical threats could potentially result in loss or damage of property, injury, or death. However, construction of components of BDCP or its alternatives would be required to comply with Cal-OSHA requirements, such as seepage cutoff walls, shoring, bracing, and other measures to protect worker safety. Design of conveyance features would also be required to comply with applicable design guidelines and standards, such as the U.S. Army Corps of Engineers design measures to control hazards to a safe level. The impacts resulting from each alternative would be minimal and no mitigation would be required. From a cumulative standpoint, the hazards associated with the action alternatives would not combine with the geologic and seismic hazards from other projects or programs to create a cumulatively significant risk at any locality in the Delta.

Soils

Chapter 10, *Soils*, describes existing soil conditions that could be affected by implementation of the BDCP or its alternatives. Soils, a key resource in the Delta, have physical and chemical characteristics that qualify them as Prime Farmland. They also support important wetland ecosystems in the Delta and Suisun Marsh.

Environmental Setting/ Affected Environment

Several groups of soil types were identified.

- Basins, Delta, and Suisun Marsh soils are at the lowest elevations and are often protected by levees. Most contain substantial organic material and are classified as peats or mucks.
- Basin rims are fine-textured mineral soils that are found along the edges of basins.
- Floodplains and stream terraces are mineral soils adjacent to major rivers and streams, and may be associated with landward sediment accumulations behind natural levees.
- Valley fill, alluvial fans, and low terraces are typically very deep with variable texture and ability to transmit water.
- Uplands and high terraces are generally well-drained and range in texture from loams to clay.

The characteristics of soil affect the way it may behave under specific land uses. This is especially important for engineering considerations. Relevant characteristics are expansiveness—the shrink-swell potential—and erodibility by water and wind.

Overview of Impacts and Mitigation

Soil-related effects are associated primarily with the footprint of the proposed conveyance facilities and restoration areas. The effects on soils may result from construction and operation of proposed water conveyance facilities and construction of restoration areas, and are evaluated based on the degree of change anticipated.

The types of effects evaluated are listed below.

- Accelerated soil erosion from water and wind.
- Loss of topsoil as a resource caused by excavation, overcovering, and inundation.
- Land subsidence due to biological oxidation of peat soils.
- Effects of corrosive, expansive, and compressible soils.

The loss of topsoil from excavation, overcovering, and inundation as a result of construction of the water conveyance facilities and other conservation measures is an unavoidable result of implementation of BDCP or its alternatives. Measures such as minimizing the extent of soil disturbance, and salvaging and replacing topsoil would reduce the severity of the impact, but not to a minimal level.

Cumulative loss of soil resources could result from implementing BDCP or its alternatives combined with other cumulative projects in the Delta.

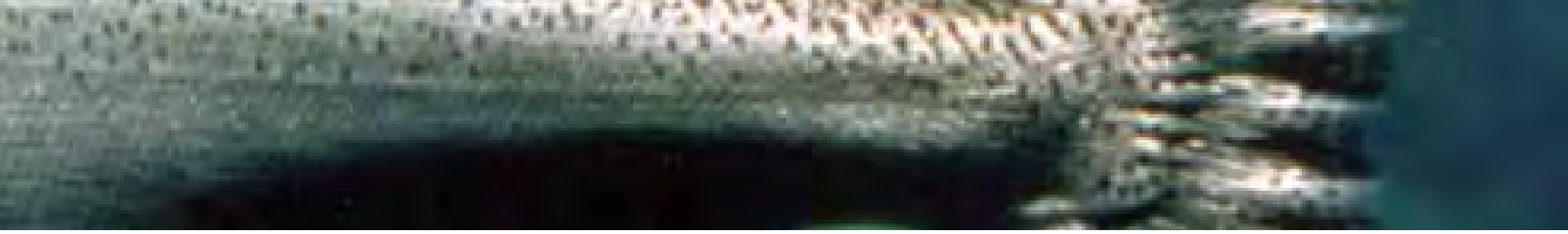
Fish and Aquatic Resources

Chapter 11, *Fish and Aquatic Resources*, discusses the effects of implementing BDCP and its alternatives on fish and aquatic resources in the Plan Area and upstream of the Delta. The analysis considers 11 covered fish species and 9 noncovered fish species. The covered species are those identified as endangered, threatened, or at risk of being listed as endangered or threatened during the BDCP permit term. The noncovered species are identified as special-status species by state or federal agencies, or are of particular ecological, recreational, or commercial importance.

Other chapters that discuss issues related to fish and aquatic resources are Chapter 6, *Surface Water*, Chapter 8, *Water Quality*, and Chapter 12, *Terrestrial Biological Resources*. A Readers Guide to Chapter 11 is also included in the Draft EIR/EIS.

Environmental Setting/ Affected Environment

The Bay-Delta system is a highly complex ecosystem that has been affected by more than a century of human activity. In addition to the native suite of aquatic species, numerous nonnative species have been introduced, both intentionally and unintentionally, with far-reaching consequences to the aquatic ecosystem. Like all estuarine systems (the interface of rivers and the ocean to which they flow), the Bay-Delta ecosystem is important to a wide array of biological processes both locally and regionally.



Overview of Impacts and Mitigation

The analysis considered four main categories of impact mechanisms.

1. Construction and maintenance of water conveyance facilities within BDCP and its alternatives.
2. Water operations of water conveyance facilities within BDCP and its alternatives.
3. Construction and implementation of restoration measures within BDCP and its alternatives.
4. Construction and maintenance of other conservation measures within BDCP and its alternatives.

The analysis focused on the types of effects listed below.

- Substantial reduction of the habitat of a fish or wildlife species.
- Decrease of a fish or wildlife population to below self-sustaining levels.
- The potential to eliminate an animal community.
- Substantial reduction of the number of an endangered, threatened, or other special-status species, or restriction of the range of such a species.
- Potential to have a substantial adverse effect, either directly or through habitat modifications, on any aquatic species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or any sensitive aquatic natural communities.
- Substantial interference with the movement of any native resident or migratory fish species.

Construction and maintenance of the water conveyance facilities could have the following impacts in the Sacramento River.

- Temporary water quality effects (such as increased turbidity).
- Elevated underwater noise conditions (associated with pile driving and the use of equipment such as boats and barges).
- Mortality or injury to fish from in-water work activities during construction.
- Temporary exclusion from or degradation of spawning, rearing, and/or migratory habitats.
- Increased predation during construction.
- Short-term effects of construction of conveyance facilities on fish would be avoided and minimized by a range of environmental commitments, detailed in Appendix 3B, Environmental Commitments, of the Draft EIR/EIS. Potentially adverse effects would be avoided and minimized by siting construction in areas minimally used by sensitive species and by confining work to specified time frames when such species are not present. Mitigation measures would be implemented to minimize the adverse effects on fish that could result from elevated underwater noise associated with impact pile driving and direct exposure to construction-related disturbance.
- Maintenance of the water conveyance facilities is expected to result in effects similar to those of construction of the facilities, but they would be less intensive and extensive. Activities associated with maintenance could include dredging, levee repair, and rip-rap placement,

requiring the in-water use of heavy equipment; or cleaning trash racks and intake screens. Maintenance work could result in such impacts as accidental spills; elevated underwater noise; and loss of spawning, rearing, or migration habitat. Project maintenance activities would entail the same mitigation measures and environmental commitments that are used during project construction to avoid and minimize adverse effects on fish and aquatic habitats.

Operations of the proposed water conveyance facilities could produce changes in water quality and habitat conditions and could expose fish to impingement, entrainment, and predation.

- Compared to baseline conditions, changes in reservoir operations and water diversions could cause changes in flow in the Sacramento River and in water circulation and quality throughout the Delta.
- Depending on the alternative, there may be an increase or a reduction of spawning and egg incubation habitats for Chinook salmon, steelhead, green and white sturgeon, and Pacific and river lamprey.

Covered Species

Delta smelt
Longfin smelt
Winter-run Chinook salmon
Spring-run Chinook salmon
Fall- / late fall–run Chinook salmon
Central Valley Steelhead
Sacramento splittail
Green sturgeon
White sturgeon
Pacific lamprey
River lamprey

Noncovered Species

Striped bass
American shad
Largemouth bass
Sacramento–San Joaquin roach
Hardhead
Sacramento tule perch
Threadfin shad
California bay shrimp

- Depending on the alternative, operation of water conveyance facilities of BDCP and its alternatives could result in an increase or reduction in the quality and extent of juvenile rearing habitat for Chinook salmon, steelhead, green and white sturgeon, and Pacific and river lamprey.
- These changes could lead to changes in spawning, migration, and rearing habitat. Potential entrainment or impingement of fish may be associated with the north Delta intakes, and the rate of entrainment or impingement at the south Delta diversions could be subject to change. Placement and operation of intakes may also affect the potential for predation.
- Spring-run and fall-run Chinook salmon would be subject to adverse and significant effects related to entrainment under Alternative 3, relative to CEQA and NEPA baseline respectively, because of changes in the timing of South Delta export operations and overlap with the presence of these species in the South Delta. The impacts would not be significant under other alternatives. Alternatives 6A, 6B, and 6C would result in a beneficial effect on entrainment because of the complete elimination of pumping at the South Delta SWP/CVP facilities.
- The presence of the proposed north Delta intake facilities could have adverse effects on migration conditions for Chinook salmon, steelhead, green sturgeon, and river lamprey as a result of increased predation and removal of in-stream habitat.
- Implementation of CM2 could improve access to spawning and rearing habitat for Sacramento splittail in the Yolo Bypass.

- Implementation of CM3 through CM7 could improve habitat conditions for one or more life stages of all covered species.
- CM2, CM4–CM7, and CM10 involve construction activities that could affect covered fish species through potential spills of construction equipment fluids; increased turbidity; increased exposure to methylmercury, pesticides, and other contaminants when upland soils are inundated; and increased exposure to contaminants from disturbed aquatic sediments. These effects would be temporary and would typically be offset by the long-term benefits of the restored habitat. Effects under some alternatives would be beneficial to covered fish species.
- The effects of CM12–CM19 and CM21 would range from no impact to beneficial for covered fish species depending on alternative and species. The conservation measures would be designed to reduce stressors on covered fish species through such actions as methylmercury management, invasive aquatic vegetation management, and dissolved oxygen level management. Although the implementation of these conservation measures entails construction activities with the potential to affect covered fish species, none of these activities would result in adverse effects on covered fish species because of Avoidance and Minimization Measures (AMMs) that are included as part of the Plan.

Terrestrial Biological Resources

Chapter 12, *Terrestrial Biological Resources*, discusses terrestrial, or land-dwelling, biological resources present in a study area that consists of the Plan Area and potential transmission line corridors outside the Plan Area (areas of additional analysis). Chapter 12 addresses the potential effects of implementing each of the BDCP EIR/EIS alternatives on these resources. The analysis considers natural communities, special-status wildlife species, special-status plant species, invasive plant species, common wildlife and plants, wildlife corridors, shorebirds and water fowl, wetlands and other waters of the United States, and compatibility with plans and policies.

Environmental Setting/ Affected Environment

The Draft EIR/EIS examines 14 natural communities and land use types, 149 special-status wildlife and plant species, and some common wildlife species. The natural communities are of special concern to resource agencies, or they require focused analysis under certain federal and state laws. The wildlife and plant species evaluated in Chapter 12 include species proposed for coverage in the BDCP as well as other special-status species that did not meet the criteria for coverage under the Plan but which are legally protected or otherwise considered sensitive by federal, state, or local resource agencies. Chapter 12 also analyzes the common wildlife species that the BDCP and its alternatives would most likely affect, especially shorebirds and waterfowl, and habitat corridors commonly used by wildlife within and beyond the study area.

In addition, the chapter discusses the potential for the BDCP and its alternatives to contribute to the spread of invasive plant species, and the potential for the BDCP and its alternatives to conflict with existing plans and policies, including approved habitat conservation plans.

Overview of Impacts and Mitigation

The potential effects of BDCP alternatives on terrestrial biological resources considered each of the alternatives' proposed features in two main areas.

- Construction, operation, and maintenance of water conveyance facilities found in BDCP and its alternatives.
- Construction and implementation of other conservation measures, primarily measures that would remove, restore, enhance, or otherwise affect wildlife and plant habitat.

The analysis focused on the following types of impacts.

- Harm or harassment of individuals or populations of a special-status species.
- Removal or damage of habitat that supports these species.
- Creation of barriers to the movement of special-status and common wildlife species.
- Substantial conflicts with goals set for special-status species in state- or federally approved recovery plans for state- or federally listed terrestrial species.
- Conflicts with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

For impacts identified as significant, AMMs developed for the BDCP and its alternatives and mitigation measures proposed in the Draft EIR/EIS would ensure that these impacts would be reduced (see BDCP Appendix 3.C for a full description of AMMs). All impacts other than impacts on wildlife movement corridors noted below would be reduced to a less-than-significant level. Overall, the BDCP and its alternatives offer benefits to terrestrial species and their habitat in the Plan Area.

Natural Communities

Impacts on natural communities were analyzed in consideration of construction, operation, maintenance, and management activities associated with the conservation measures. Two time periods were analyzed: near-term (over the first 10 years of Plan implementation) and late long-term (over the entire 50-year term of the Plan). The impact analysis focused on those conservation measures that would either eliminate natural community acreage through construction or restoration activities, or that would result in periodic inundation of the community.

- Construction and grading activities could result in losses or conversion of some natural communities. Under BDCP alternatives, however, these losses or conversions would be entirely offset by habitat restoration, protection, enhancement, and management actions that would result in overall increases in the habitat value of natural communities.
- Construction of the western alignment of the water conveyance facilities as proposed under Alternatives 1C, 2C, and 6C would result in significant impacts on alkali seasonal wetland complex, vernal pool complex, and other natural seasonal

wetland natural communities. Construction of the Alternative 9 water conveyance facilities would result in significant impacts on the valley/foothill riparian natural community. Implementation of proposed mitigation measures would reduce all these impacts to a less-than-significant level.

- Some conservation measures found in the BDCP and its alternatives would modify the inundation regimes of both natural and artificial waterways and floodplains in the study area, including Yolo Bypass.
- Natural communities would be modified by ongoing and periodic operations, maintenance, and management activities associated with the conservation measures. The periodic actions would involve access road and conveyance facilities repair, vegetation management at the various water conveyance facilities and habitat restoration sites, levee repair and replacement of levee armoring, channel dredging, and habitat enhancement in accordance with natural community management plans.

Special-Status Wildlife and Plants

The analysis considered both direct and indirect effects of implementing BDCP and its alternatives. The assessment evaluated permanent, temporary, and periodic effects on special-status species.

- Several wildlife species would be subject to temporary or permanent loss or conversion of habitat as well as the risk of injury or direct mortality associated with construction, operations, and maintenance of water conveyance facilities. Restoration activities could also result in habitat conversions, and injury or mortality of individuals. Such impacts would vary by species and, to some extent, by alternative. Mitigation measures include conducting preconstruction surveys, avoiding disturbance of sensitive species, compensating for the near-term loss of habitat for some special-status bird species, and protecting foraging habitat for greater and lesser sandhill cranes. Such measures would reduce these impacts to a less-than-significant level.
- New transmission lines could have an adverse effect on birds as a result of power line strikes, depending on the species' flight patterns and the location and height of the transmission lines. For bird species with a higher risk of power line strikes, implementation of an AMM that includes a number of specific transmission design options could reduce these effects.
- Some wildlife species would be subject to indirect effects associated with construction-related activities, changes in aquatic habitat, salinity, and methylmercury exposure. Examples of such effects include noise and visual disturbances from construction of the water conveyance facilities and restoration efforts; potential spills from construction equipment; and methylmercury accumulation resulting from marsh and floodplain restoration. The incorporation of AMMs would avoid or reduce the adverse indirect effects of implementing BDCP or its alternatives on wildlife species covered by the BDCP; however, without additional mitigation, indirect effects could be significant for special-status species of birds, reptiles, and mammals not covered by the BDCP or its alternatives.

While the impacts vary by species, these impacts could result in, for example, loss or abandonment of nests and mortality of any eggs and/or nestlings if construction occurs during nesting season, disturbance of bat roosts, and injury or mortality of individuals. Mitigation measures proposed in the Draft EIR/EIS include conducting preconstruction surveys for species, avoiding bird nests, bank swallow colonies, and bat roosts, and conducting construction activities outside of the breeding season. With implementation of these mitigation measures, indirect effects of implementation of BDCP or its alternatives would have a less-than-significant impact on wildlife species.

- Altering the inundation regime of the Yolo Bypass to benefit fish species and restoring seasonally inundated floodplains would affect wildlife species. However, considering other habitat restoration and protection provisions, and the implementation of applicable AMMs and mitigation measures, these impacts would be offset.
- The effects of changes in water releases from upstream reservoirs and water conveyance facilities were analyzed. One bird species—bank swallow—could be affected because even moderate changes in seasonal river flows could affect nesting bank swallow habitat. Implementation of a mitigation measure requiring monitoring of bank swallow colonies and evaluation of winter and spring flows upstream of the Plan Area would address this impact and could lead to additional mitigation.
- Implementation of conservation measures would have adverse effects on plant habitat and populations. Implementation of BDCP or its alternatives would have a significant impact on some noncovered special-status species of alkali seasonal wetland plants, tidal wetlands plants, and nontidal wetland plants. Construction of the western alignment of the water conveyance facilities as proposed under Alternatives 1C, 2C and 6C also would have a significant impact on noncovered special-status vernal pool plants. Extending the application of AMMs to noncovered special-status plant species as a form of mitigation would reduce these impacts. Implementation of mitigation for noncovered special-status species, similar to the AMMs for covered species, in addition to a mitigation measure requiring restoration of vernal pools, would reduce impacts.

General Terrestrial Biology

For the purposes of Chapter 12, general terrestrial biological resources impacts involve wetlands, waterfowl and shorebirds, common wildlife and plants, invasive plant species, wildlife movement corridors, and compatibility with plans and policies as a result of construction of water conveyance facilities and implementation of habitat restoration, enhancement, and protection measures.

- Construction of the water conveyance facilities and implementation of other conservation measures would cause the temporary and permanent removal, alteration, or conversion of wetlands and other waters of the United States. However, the creation of approximately 66,200 acres of wetlands and open waters would far exceed the typically required 1:1 wetland replacement ratio. Ultimately, implementation of BDCP or its alternatives would benefit wetlands and waters of the United States.

- Implementation of habitat creation and enhancement measures would alter the type of some wetlands and convert some cultivated lands to wetlands. These habitat conversions would have negative consequences for some species of waterfowl and shorebirds but would benefit others. Implementation of mitigation measures requiring subsequent monitoring, study, and subsequent wetland management adjustments would reduce these impacts.
- The effects on common wildlife and plant habitat would be greatly offset by other habitat protection, restoration, and enhancement activities.
- Construction of the conveyance facilities would create barriers to wildlife movement in the study area. Overall, restoration activities within BDCP and its alternatives would improve opportunities for wildlife habitat connectivity within the study area and between the study area and adjacent habitats. Construction of the eastern alignment of the conveyance facilities proposed under Alternatives 1B, 2B, and 6B would create a substantial barrier to the east-west movement of wildlife within and outside of the study area and create a barrier to wildlife movement in the area west of Stone Lakes.

Area (in acres) of Natural Communities and Land Cover Types in the Terrestrial Biology Study Area

Natural Community Type	BDCP Plan Area	Areas of Additional Analysis	Study Area Total	Percentage of the Study Area
Tidal Perennial Aquatic	86,263	---	86,263	10%
Tidal Brackish Emergent Wetland	8,501	---	8,501	<1%
Tidal Freshwater Emergent Wetland	8,856	---	8,856	1%
Valley/Foothill Riparian	17,644	322	17,966	2%
Nontidal Perennial Aquatic	5,489	78	5,567	<1%
Nontidal Freshwater Perennial Emergent Wetland	1,385	124	1,509	<1%
Alkali Seasonal Wetland Complex	3,723	---	3,723	<1%
Vernal Pool Complex	11,284	849	12,133	1%
Managed Wetland	70,698	100	70,798	8%
Other Natural Seasonal Wetland	276	566	842	<1%
Grassland	76,315	1,732	78,047	9%
Inland Dune Scrub	19	---	19	<1%
Cultivated Lands	481,909	5,197	487,106	56%
Developed	90,278	382	90,660	10%
Total	**862,640**	**9,350**	**871,990**	**100%**

Construction of the western alignment conveyance facilities proposed under Alternatives 1C, 2C, and 6C also would create substantial barriers to the east-west movement of wildlife in the southwestern portion of the study area as well as create a barrier to the north-south movement of wildlife within the central Delta. These impacts cannot be fully mitigated.

- Although land disturbance caused by implementation of the BDCP or its alternatives would increase opportunities for the spread of invasive plant species, implementation of habitat measures and AMMs would reduce the potential for the introduction and spread of invasive plants.
- Implementation of BDCP and its alternatives was determined to be compatible with other federal, state, and local plans and policies that address terrestrial biological resources, and with other Habitat Conservation Plans and Natural Community Conservation Plans that overlap the study area.

Cumulative Impacts

Implementation of BDCP and its alternatives would contribute to a variety of cumulative impacts on terrestrial biological resources. In combination with past, present, and reasonably foreseeable projects, impacts on giant garter snake movement under Alternatives 1B, 2B, and 6B, and impacts on wildlife corridors more generally under Alternatives 1B, 6B, 1C, 2C, and 6C would be cumulatively considerable. There is no feasible mitigation for these impacts.

Land Use

Chapter 13, *Land Use*, describes existing and planned land uses in the Plan Area that could be affected by construction and operation of BDCP or its alternatives.

Environmental Setting/ Affected Environment

Land use is governed by federal, state, and local plans, policies, and regulations. Generally, state and federal agencies, as well as some local and regional agencies, involved in the location or construction of water facilities are not subject to local land use regulations. Nevertheless, the Draft EIR/EIS considers local land use regulations—particularly those whose purpose is the avoidance or mitigation of environmental impacts. The BDCP and its alternatives were analyzed considering local land use policies, regulations, or plans.

Overview of Impacts and Mitigation

Impacts on land use may result from implementation of the BDCP and its alternatives. The analysis assumes that an action would have an adverse effect if it would result in one of the following conditions.

- Physical division of an established community.
- Conflict with or violation of any applicable land use plan, policy, or regulation adopted to avoid or mitigate an environmental effect.
- Creation of land uses substantially incompatible with existing land uses in or adjacent to the Plan Area.

While construction of water conveyance facilities would otherwise be anticipated to result in substantial inconsistencies with local land use regulations because of the size and number of structures necessary for construction, public water supply and treatment facilities are exempt from local land use policies. Nevertheless, the impact types listed below were identified.

- Construction could temporarily disrupt access through the community of Hood; however, no community would be subject to permanent physical division as a result of implementing BDCP or its alternatives.
- Many conservation measures would take place on land governed by policies designed to avoid or mitigate environmental effects. However, impacts on land use related to conservation actions would have to be determined on a site-specific basis (through additional environmental review) because precise locations are not yet identified.
- A number of existing buildings would be removed during construction of the proposed water conveyance facilities. Compensation to property owners for the value of property loss would reduce the severity of related economic effects but would not reduce the severity of the physical impact itself. Adjacent existing land uses, such as farming, could be incompatible with the BDCP and its alternatives.

Agricultural Resources

Chapter 14, *Agricultural Resources*, describes the possible effects of implementing BDCP or its alternatives on the Delta's agricultural region. Many topics related to agricultural resources are discussed in other chapters: Chapter 5, *Water Supply*; Chapter 6, *Surface Water*; Chapter 7, *Groundwater*; Chapter 8, *Water Quality*; Chapter 9, *Geology and Seismicity*; Chapter 10, *Soils*; Chapter 12, *Terrestrial Biological Resources*; Chapter 16, *Socioeconomics*; Chapter 24, *Hazards and Hazardous Materials*; Chapter 25, *Public Health*; Chapter 28, *Environmental Justice*; and Chapter 30, *Growth Inducement*.

Environmental Setting/ Affected Environment

According to the California Department of Food and Agriculture (CDFA), the state exports agricultural products to more than 190 countries. A 2011 report from the Delta Protection Commission estimates total agricultural revenues in the Delta at $795 million in 2009: $702 million in crop revenue and $93 million from animals and animal products. More than 30 types of crops are cultivated in the Plan Area. Almonds, rice, wine, pistachios, walnuts, and dairy products are among the highest value crops.

Overview of Impacts and Mitigation

Implementation of the BDCP or its alternatives would affect agricultural activities in the Cache Slough, Cosumnes/Mokelumne, Suisun Marsh, West Delta, and South Delta Areas.

Implementing BDCP or its alternatives would result in temporary effects associated with construction of water conveyance facilities, as well as permanent conversion of agricultural lands to nonagricultural uses.

Potential changes in water quality and soil salinity have been identified using information from Chapter 8, Water Quality. Such changes could influence irrigation practices and could alter the range of crops that are economically viable.

The significant impacts listed below have been identified.

- Construction of the water conveyance facilities would result in temporary, short-term, and permanent conversion of Important Farmland or land subject to Williamson Act contracts or in Farmland Security Zones. Mitigation would not fully reduce all of the impacts. In addition, there could be indirect effects associated with construction of the conveyance facilities.
  - › The conveyance facilities could cause seepage or changes in groundwater elevation. Design modifications could reduce these effects.
  - › There could be increased salinity in irrigation water, reducing crop yields.
  - › Conveyance facilities could result in conflicts with existing irrigation and drainage facilities.
- Restoration activities would result in temporary, short-term, and permanent conversion of Important Farmland or land subject to Williamson Act contracts or in Farmland Security Zones. While specific locations have not been selected, habitat restoration and channel margin habitat enhancement would likely occupy existing Important Farmland, directly precluding agricultural use. Associated construction activities may also result in temporary conversion of farmland. Mitigation would reduce the severity of these impacts, but not fully mitigate the impacts. Conversion associated with restoration activities could also result from indirect effects.
  - › Restoration activities could lead to seepage or changes in groundwater elevation. Design modifications could reduce these effects.
  - › Increased salinity in irrigation water could lead to reduced crop yields.
  - › Restoration activities could conflict with existing irrigation and drainage facilities.
  - › Modified habitats could lead to changes in microclimates and localized growing conditions.
  - › Restoration activities could result in increased frequency, duration, and magnitude of inundation. However, increased inundation could recharge and raise the groundwater table.

To address these impacts, the BDCP proponents have developed an Agricultural Lands Stewardship Plan (ASLP). The ASLP would set forth measures to promote agricultural productivity through early planning, site-specific avoidance and mitigation, onsite mitigation, and landowner participation.

The same peat soil that supports the wide range of valuable crops in the Delta leaves much of the Delta landscape subject to subsidence: the lowering of land surface as organic carbon in the soil decomposes. While the decomposition of peat soil is the main cause of subsidence, processes such as mechanical compaction, wind erosion, groundwater overdraft, and tectonic movements are other contributing factors. Recent estimates have predicted that 3-4 feet of additional subsidence would occur in the central area of the Delta by 2050.

In addition, the fine particles of peat soil can often become an air quality issue when these particles are disturbed and become airborne.

Important Farmland and the Williamson Act

USDA rates agricultural land according to soil quality and irrigation status; the best quality land is called Prime Farmland. Other designations are Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance. Under the state's Williamson Act, land may be enrolled under the "Prime Agricultural Land" designation if it meets certain economic or production criteria.

The California Land Conservation Act—known as the Williamson Act—is an agricultural land protection program enacted by the California Legislature to help maintain the agricultural economy of the state by preserving its agricultural land. The act discourages premature and unnecessary conversion of agricultural land to urban uses. The legislation benefits landowners by allowing them to enter into long-term contracts (10 or 20 years) with the state of California to keep agricultural land in production. In return, the state reduces property taxes based on a calculation tied to agricultural income.

Estimated Conversion of Important Farmland to Nonagricultural Uses in CM1

Alternative	Permanent Surface Impacts	Temporary and Short-Term Surface Impacts	Grand Total	Percent of Total Important Farmland in Plan Area
Alternatives 1A and 6A	4,984	1,329	6,313	1.23%
Alternatives 1B and 6B	18,875	2,144	21,019	4.10%
Alternatives 1C and 6C	13,014	3,170	16,184	3.16%
Alternative 2A	4,992	1,826	6,818	1.33%
Alternative 2B	18,868	2,669	21,537	4.20%
Alternative 2C	13,019	3,170	16,189	3.16%
Alternative 3	4,838	953	5,791	1.13%
Alternative 4	4,975	1,315	6,290	1.23%
Alternative 5	4,770	833	5,603	1.09%
Alternatives 7 and 8	4,883	1,105	5,987	1.17%
Alternative 9	2,459	559	3,018	0.59%

Recreation

Chapter 15, *Recreation*, examines the effects of implementing BDCP or its alternatives on recreational experiences and facilities. Other chapters that discuss tourism and recreation are Chapter 16, *Socioeconomics*, Chapter 17, *Aesthetics and Visual Resources*, Chapter 20, *Public Services and Utilities*, and Chapter 23, *Noise*.

Environmental Setting/ Affected Environment

The Plan Area contains numerous parks, public lands, and many interconnected rivers, sloughs, and other waterways that offer diverse recreation opportunities. Privately owned commercial marinas and resorts offer access to the waterways and a variety of other recreational opportunities and services. Private lands also provide recreational opportunities, particularly hunting.

Overview of Impacts and Mitigation

The impact analysis evaluated changes in upstream reservoir levels, access to Delta recreation sites, and disruption of existing Delta recreation opportunities such as boating and fishing.

Types of Recreation in the Plan Area

- Boating
- Fishing
- Birding and Wildlife viewing
- Sightseeing
- Walking
- Picnicking
- Camping
- Cruising
- Waterskiing
- Wakeboarding
- Sailing
- Windsurfing
- Kiteboarding
- Hunting
- Sightseeing and vineyard tours

The following impacts to recreational opportunities in the Delta were identified.

- No direct effects on recreational facilities from construction.
- Construction of water conveyance facilities would disrupt and reduce some recreational opportunities and experiences. Construction noise, additional traffic, detours from typical access points, boat traffic delays or impediments and visual degradation could result in impacts on recreation near construction areas. These impacts could last 3 to 9 years depending on the facility location. Although mitigation would reduce many of the impacts, it is not certain that the level of impacts would be reduced over the entire study area. Mitigation measures would be implemented to protect birds and wildlife and to provide alternate access to bank fishing sites. Many of the construction-related mitigation measures described in Chapters 17, 19, 20, and 23 would also reduce the impacts on recreation.
- Construction of fish screens and intakes under Alternative 9 would result in the permanent loss of well-established recreation facilities: Boathouse Marine, Walnut Grove public guest dock, and Boon Dox guest dock. The BDCP proponents would assist with funding the expansion of state recreation areas in the Delta to offset these losses.
- Implementation of CM2-CM11, CM15, and CM16 could reduce boating-related recreational opportunities, depending on location and how they are implemented. Most impacts would be highly localized and temporary, stemming from

construction activities that could limit boat access and speeds, or that could create noise, odors, or unattractive visual scenes. However, conservation measures would also expand the extent of navigable water in various locations, leading to an enhanced boating experience.

- Implementation of CM2-CM11, CM15, and CM16 would reduce upland recreational opportunities: hunting, hiking, walking, plant and wildlife viewing, photography, picnicking, and sightseeing, depending on location and how they are implemented. Site preparation and construction activities would also temporarily compromise the quality of recreational experiences. New sites could also be restored or enhanced, thereby improving the quality of recreational opportunities.

The BDCP reserve system would consist of approximately 61,000 acres of land, with more than 170 miles of trails, 4 picnic areas, 15 new trailhead facilities and one updated boating facility, and a new boat launch within the footprint of the North Delta diversion facilities. Permitted activities would include hiking, wildlife viewing, docent-led wildlife and botanical tours, bicycling, equestrian use, hunting, fishing, and boating.

Over the long term, several CMs could have beneficial impacts on recreation. The impact on fishing opportunities would be beneficial because the conservation measures are intended to enhance aquatic habitat and fish abundance.

Socioeconomics

Chapter 16, *Socioeconomics*, describes the socioeconomic conditions in the Delta and the potential effects of BDCP alternatives. The analysis is both quantitative and qualitative, focusing on community character, social and economic characteristics, population, housing, employment, and income at regional levels.

Environmental Setting/ Affected Environment

Socioeconomics is a broad category that, in this Draft EIR/EIS, considers regional economics, population and housing, community character, recreational economics, agricultural economics, and municipal and industrial economics.

Delta community characteristics include location, small town feeling or rural setting, proximity to recreational opportunities, and cultural and natural heritage, all of which contribute to a sense of place. The socioeconomic effects described in Chapter 16 are related to a number of physical effects that are addressed in other chapters—especially Chapter 14, Agricultural Resources, and Chapter 15, Recreation. Chapter 16 makes frequent reference to these other chapters. Where changes in community character are of a social rather than a physical character, they are not considered impacts under CEQA but are still subject to NEPA evaluation.

Overview of Impacts and Mitigation

Effects on socioeconomic conditions were considered to occur if implementation of an alternative (construction, operations, maintenance, and restoration) would result in changes to any of the characteristics listed above.

Effects that could occur during or as a result of construction activities were considered temporary effects; effects that could occur during or as a result of operation and maintenance activities were considered permanent effects.

Socioeconomic effects are described at a project level for construction, operation, and maintenance of the conveyance facilities. Effects that would result from implementation of other conservation measures are described at a program level.

The impact analysis considered the following categories of effects.

- Effects of construction, operation, and maintenance of conveyance facilities under CM1 and implementation of CM2 through CM4 in the Plan Area.
- Effects in hydrologic regions outside of the Delta that could result from changes in water deliveries or water transfers.

The analysis identified the following socioeconomic impacts and mitigation measures.

- Construction and ongoing operation and maintenance activities would increase regional employment and income and could have positive effects on the character of Delta communities.
- Permanent removal of agricultural land from production would have a negative effect on employment and income. Activities associated with CM1 would result in a substantial decline of total irrigated crop acreage during construction; however, much of this land could later return to agricultural use. About 4,400 acres could be taken out of production over the long term as a result of operations and maintenance. Where required, compensation to property owners would reduce the severity of economic effects related to the loss of agricultural land, but it would not reduce the severity of the physical impact itself (See Chapter 14, Agricultural Resources).
- Potential impacts on community character (e.g., variations in demographic composition, changes to legacy communities) are anticipated to result from construction and operations. Agricultural contributions to the community are likely to decline, and recreational activities would likely be temporarily disrupted. Additional regional employment and income could create net positive effects. Mitigation measures related to noise, visual effects, transportation, agriculture, and recreation would reduce adverse effects.
- Restored habitat could support rural qualities in terms of visual resources and recreational opportunities by attracting residents and encouraging recreation and tourism. Implementation of CM3 would ensure continuation of agricultural activities on thousands of acres in the Delta. Spending to restore habitat could result in increased income and employment.
- Construction and long-term operations of CM1 could result in the removal of a portion of the property tax base. The Sacramento–San Joaquin Delta Reform Act commits entities receiving water from

the SWP and CVP to provide mitigation for lost property tax and assessment revenue associated with land needed for the construction of new conveyance facilities. Losses may be offset in part by an anticipated increase in sales tax revenue resulting from increased income and employment in the region. Forgone property tax and assessment revenue from implementation of CM2-CM22 is estimated to reach $173 million over the 50-year permit term—less than 1% of the Delta counties' property tax revenue.

- While recreational facilities would not be relocated because of construction, substantial temporary disruption of recreational activities could reduce recreation-related spending. While access to all existing recreational facilities, including marinas, would be maintained throughout construction, the quality of the experience could be adversely affected, leading to fewer visits over the construction term. Mitigation efforts would include a noise abatement plan and notification of maintenance activities in waterways. A number of proposed commitments to support recreation are outlined in Chapter 15, including bank fishing access sites, visual barriers to construction work, avoidance of nesting birds, and installation of project landscaping.
- The total value of irrigated crop production in the Delta would decline. Changes in crop acreage were used to describe the associated changes in economic values. The total value of irrigated crop production in the Delta would decline on average by $8.7 million per year during construction and by $7.2 million per year during operation and maintenance. These estimates are not dependent on water year type. Loss of investment in production facilities and in orchards and vineyards would occur, varying widely across parcels. The reduction in the value of production is not considered an environmental impact under CEQA; however, effects associated with conversion of agricultural land are discussed in Chapter 14. The BDCP and its alternatives would provide compensation when required; this compensation would reduce the severity of the economic impact, but not of the physical impact. Slight changes in salinity of agricultural water supply are expected during construction, with minor resulting costs.
- In the absence of the BDCP or its alternatives, Delta communities and socioeconomic conditions would be subject to long-term risks from climate change, seismic activity, and other phenomena described in Appendix 3E, Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies, of the Draft EIR/EIS.

Aesthetics and Visual Resources

Chapter 17, *Aesthetics and Visual Resources*, examines the effects of implementing BDCP or its alternatives on the visual resources of the Plan Area. Visual resources are also discussed in Chapter 15, *Recreation*, and Chapter 16, *Socioeconomics*.

The *aesthetic value* of an area is a measure of visual character and quality, combined with the viewer response to the area. *Scenic quality* is described as the overall impression that an individual retains after passing through an area. Viewer response is a combination of viewer exposure—number of viewers, distance from the view and duration of views—and viewer sensitivity—the extent of public concern for a viewshed.

Environmental Setting/ Affected Environment

Visual resources both inside and outside the Plan Area include views of State Recreation Areas, wildlife refuges, the Diablo Range, and the Vaca Mountains. In addition, human-made structures such as bridges and townsites add aesthetic value.

Identifying a project area's visual resources and conditions involves three steps.

1. Objective identification of the visual features of the landscape, including designated scenic vistas or state scenic highways.
2. Assessment of the character and quality of those resources relative to overall regional visual character.
3. Determination of the importance to people, or sensitivity, of views of visual resources in the landscape.

Overview of Impacts and Mitigation

The focus of the visual analysis is on the BDCP alternatives' potential to adversely affect views. Publicly accessible locations in the communities from which residents would view the study area are of primary importance in this analysis.

The primary features of the various alternatives that would affect the existing visual character of the Plan Area are listed below. Alternative-specific features are identified by the alternatives with which they would be associated.

- Intake structures.
- Forebays with embankments.
- Pumping plants.
- Control structures.
- Soil spoil and borrow sites.
- Reusable tunnel material (RTM) storage areas
- Work/staging areas.
- Shaft sites (Alternatives 1A, 2A, 3, 4, 5, 6A, 7, and 8).
- Canals (Alternatives 1B, 1C, 2B, 2C, 6B, 6C, and 9).
- Bridges (Alternatives 1B, 1C, 2B, 2C, 6B, 6C, and 9).
- Operable barrier(s) (Alternatives 2A, 2B, 2C, 4, and 9).
- Temporary and permanent access roads.
- Transmission lines.
- Concrete batch plants and fuel stations.
- Restoration areas.

These changes would be most evident in the northern portion of the Plan Area. Construction of the intakes and the accompanying facilities would introduce visually dominant features in the foreground and middleground views, distracting from the visual quality of the scenic highways.

The following activities and components of BDCP and its alternatives have been identified as having significant impacts.

- Construction and presence of the conveyance facilities would cause temporary and permanent alterations in existing visual quality.
- Permanent impacts on views along a State Scenic Highway.
- Construction and operation of conveyance facilities would create a new source of light or glare, adversely affecting views.
- Implementation of conservation measures would substantially alter existing visual quality or character.

Implementation of the mitigation measures summarized below would reduce the severity of these impacts, but may not fully mitigate impacts under all circumstances.

- Locate new transmission lines and access routes to minimize the removal of trees and shrubs.
- Install visual barriers between construction work areas and residences.
- Develop and implement a spoil/RTM management plan that includes revegetation and terrain redesign.
- Restore barge unloading facility sites to preconstruction conditions.
- Use structure finishing treatments (paint, fence products) that minimize visual impacts and complement the natural landscape and existing aesthetic treatments.
- Locate fueling stations and concrete batch plants away from scenic highways and residences, and restore these sites when these temporary facilities are decommissioned.
- Implement best management practices into landscape plans.
  - › Reduce runoff.
  - › Use plants, trees, and landscape berms to screen buildings.
  - › Use native plants and grasses where possible; do not use invasive plants at any location.
  - › Minimize the use of plants requiring permanent irrigation systems.
- Limit construction activities to daylight hours within 0.25 mile of residents.
- Limit the use of nighttime and portable lights, and operate them at the lowest allowable wattage and height.

Maintenance and operation of the water conveyance facilities, once they have been constructed, would not result in further substantial changes to the natural viewshed or terrain.

Cultural Resources

Cultural resources are defined as prehistoric and historic archaeological resources, architectural / built-environment resources, places important to Native Americans and other ethnic groups, and human remains. Chapter 18, *Cultural Resources*, assesses the potential effects of implementing BDCP or its alternatives on cultural resources.

Environmental Setting/ Affected Environment

The Central Valley, including the Plan Area, has experienced a rich history of human habitat for several millennia. Since Euroamerican contact and the Gold Rush, the Delta has undergone a great deal of historical development, critical to the understanding of California and American history. However, the extent of historic and recent agricultural development, water management, flood control measures, and urban development has damaged or modified much of the prehistoric record, although a number of historic-era resources are scattered throughout the area.

Overview of Impacts and Mitigation

Archival map research, record searches, field and archaeological surveys, aerial photography, and correspondence with Native American contacts were used to compile an overview of the potential for the BDCP alternatives to affect cultural resources. Experts concluded that appropriate samples, thorough record searches, and analyses of aerial photographs would provide them with sufficient data to characterize the nature of the resources and the likely effect of the BDCP alternatives.

The analysis focused on the following types of effects.

- Ground-disturbing construction that would damage historic or prehistoric archaeological sites or unearth and damage human remains.
- Direct demolition of built-environment resources such as historic-era residences, structures, or buildings.
- Direct excavation or alteration of traditional cultural properties.
- Direct effects on individual resources, leading to adverse effects on rural historic landscapes.
- Potential to alter, directly or indirectly, any of the characteristics of a property that qualify it for inclusion in the National Register of Historic Places.

Depending on the BDCP alternative, a number of both identified and unknown archaeological resources could be affected by construction of the conveyance facilities and implementation of the other conservation measures. The mitigation efforts outlined below would reduce these impacts, but they would not guarantee that all cultural resources could be discovered and appropriately treated in advance of construction.

The following mitigation measures are recommended to lessen impacts on cultural resources.

- Conduct phased inventory and evaluation of resources.
- Prepare a data recovery plan and perform data recovery excavations.

- Prepare treatment plans as appropriate for affected cultural resources (archaeological or built environment), consult with relevant parties, and implement treatment.
- Prepare a Cultural Resources Monitoring and Discovery Plan, implement training of construction workers, and conduct construction monitoring.
- Stop work if archaeological resources or human remains are discovered.
- Conduct inventory, evaluation, and treatment of identified archaeological resources.
- Consult with relevant parties to identify traditional cultural properties; evaluate identified resources as described in National Register Bulletin; follow state and federal laws governing human remains if such resources are discovered during construction.
- Conduct cultural resource studies and adopt cultural resource mitigation measures for cultural resource impacts associated with implementation of restoration-related conservation measures.

Transportation

Chapter 19, *Transportation*, examines the transportation systems that serve the study area and the potential effects of BDCP alternatives implementation on roadway, marine, rail, air, and transportation facilities. Additional discussions of transportation are presented in Chapter 16, *Socioeconomics*, and Chapter 24, *Hazards and Hazardous Materials*.

The study area for transportation consists of the BDCP Plan Area as well as roadway segments outside the Plan Area that could be affected by construction activities.

Environmental Setting/ Affected Environment

Several important highways pass through the transportation study area. Priority freight corridors are the Interstate highways (I-5, I-80, I-205, and I-580) in addition to State Route 99, the Union Pacific Railroad (UPRR) route along the I-80 corridor, and the BNSF Railway line between Antioch and Stockton. Substantial transportation capacity is also provided by the study area's marine facilities. Navigable coastal waters—rivers, bays, and ports—parallel the entire I-5 corridor. The study area has two commercial service airports and four general aviation airports, as well as many small airstrips associated with ranching or farming operations and charter flight and recreational enterprises.

Overview of Impacts and Mitigation

Each transportation mode (roadways, navigation, transit services, rail, and bicycles) was evaluated for temporary impacts during construction and permanent impacts during

operation of the water conveyance facilities, as well as for potential effects related to other conservation measures. Several conservation measures—CM12, CM14, CM17, CM18, CM19, and CM22—would not have any effect on transportation because they are not land based.

The analysis focused on the following types of effects.

- Substantial increases in traffic, delays in traffic, or alteration of current circulation patterns.
- Creation of traffic hazards or deterioration of roadways.
- Interference with emergency management and evacuation routes.
- Disruption of marine, air traffic, or transit service during construction or operations.
- Interference with bicycle routes.
- Conflicts with adopted policies, plans, or programs supporting alternative transportation (such as bicycles and transit services).

The analysis identified the impacts listed below.

- Increased traffic volume, traffic delays, and changes in circulation patterns would result from construction, operations of water conveyance facilities, and restoration within BDCP and its alternatives, but implementation of the mitigation measures summarized below would reduce these impacts.
  - › Implement a site-specific construction management plan.
  - › Limit hours of construction activities on congested roadways.
  - › Fund improvements on congested roadway segments, based on good faith efforts to enter into agreements with appropriate agencies.
- Increased traffic hazards and roadway damage could result from the related activities of BDCP and its alternatives during construction, but implementation of the mitigation measures summarized below would reduce these impacts.
  - › Prohibit or limit construction activities on physically deficient roadway segments.
  - › Improve the physical conditions of roadway segments as stipulated in mitigation agreements or encroachment permits.
- Agreements to improve congested roadways would reduce impacts on emergency response times during construction.
- A construction traffic management plan would further reduce potential disruptions marine and rail traffic and bicycle routes during construction.
- Disruption of transit services during construction would be an impact. The mitigation measures outlined below would not fully mitigate the severity of this impact.
  - › Implement a site-specific construction management plan.
  - › Limit hours of construction activities on congested roadways.
  - › Make good faith efforts to enter into agreements with appropriate agencies to fund improvements on congested roadway segments.

Public Services and Utilities

Chapter 20, *Public Services and Utilities*, describes the potential effects of implementing BDCP or its alternatives on public services and utilities. Public services consist of law enforcement, fire protection and emergency response, hospitals and medical services facilities, public schools, and libraries. Utilities comprise solid waste management, water supply and treatment, wastewater treatment, energy (electricity and natural gas), and communications.

Environmental Setting/ Affected Environment

Public services and utilities are provided throughout the Plan Area (and the areas of additional analysis) by various entities: counties, cities, community services/special districts, and private companies.

Overview of Impacts and Mitigation

The analysis considered permanent and temporary effects, both direct and indirect, on public services and utilities. Consistency with general plans and local policies was also evaluated.

Public service and utility facilities and infrastructure and emergency access routes were compared to conveyance facility alignments and potential restoration areas using geographic information system (GIS) analysis. Public services and utility providers were contacted directly for the locations of current and planned services and facilities within or partially within the alignments and construction footprints of the alternatives. GIS analysis was used to determine if services or infrastructure would be affected by the alternatives in either the short or long term.

The analysis focused on the types of impacts listed below.

- Need for new or altered public service facilities.
- Disruption of existing utility services.
- Need for new water or wastewater treatment facilities or expansion of existing facilities.
- Lack of sufficient water supply, or a need for new or expanded water supply resources.
- Generation of solid waste in exceedance of the current permitted capacity of landfills.
- Noncompliance with applicable federal, state, and local statutes and regulations related to solid waste.

The analysis identified these impacts.

- Public service facilities could be displaced as a result of constructing the proposed water conveyance facilities and conservation measures. Funding would be provided to construct new facilities prior to the start of any activities that would disrupt services.
- Local utility services could be disrupted as a result of constructing the proposed water conveyance facilities and conservation measures.

To avoid disruptions, locations of utility infrastructure would be verified, and plans for excavations would be checked and updated weekly. Utility infrastructure would be relocated, if necessary, in a manner designed to avoid or minimize any effect on operational reliability and on public health and safety. Relocations would be coordinated to integrate with other construction projects and minimize disturbance of communities.

Energy

Chapter 21, *Energy*, describes and evaluates the energy production and use associated with the existing SWP and CVP facilities, and the additional energy requirements needed for construction, and operation and maintenance of the BDCP and its alternatives.

Environmental Setting/ Affected Environment

Hydropower energy generation is a major purpose of the CVP and SWP. Annual hydropower generation averages about 4,500 gigawatt hours (GWh) from existing SWP facilities, while they use about 9,000 GWh for pumping. Existing CVP facilities generate about 5,500 GWh, while they use about 1,500 GWh for pumping.

Potential effects of climate change on hydrology (runoff and seal level rise) could affect energy production and consumption in the future.

Overview of Impacts and Mitigation

Changes resulting from operation of water conveyance facilities in the BDCP and its alternatives could increase the net energy gap between hydropower generation and the pumping energy consumption of CVP and SWP facilities. Such effects could result from both construction and operation of features within BDCP and its alternatives. The analysis evaluated the alternatives to determine if any of them would result in an increase in energy use compared to the No Action Alternative.

The analysis focused on the following types of impacts.

- Wasteful or inefficient energy use for temporary construction activities, pumping, and conveyance.
- Compatibility with plans and policies related to energy resources.

No substantial increases in energy demand were identified. Construction, operation, and maintenance activities would include all feasible controls for energy efficiencies.

Understanding Energy Evaluation

The basic units of electrical power (capacity) are kilowatt (kW), megawatt (MW), and gigawatt (GW). A megawatt is 1,000 kW, and a gigawatt is 1,000,000 kW or 1,000 MW. It is common for energy to be reported as the power supplied or consumed over a unit of time. For instance, generating electricity at the rate of 1 kW for 1 hour is a kilowatt hour (kWh). A 100 MW (100,000 kW) generating facility would produce 2,400,000 kWh (2,400 megawatt hours (MWh) or 2.4 gigawatt hours [GWh]) in a day.

Air Quality and Greenhouse Gases

Chapter 22, *Air Quality and Greenhouse Gases*, examines the effects of implementing BDCP or its alternatives on air quality, focusing on criteria pollutants and greenhouse gas (GHG) emissions. The effects of the BDCP alternatives on the resiliency and adaptability of the Plan Area to climate change are described in Chapter 29, *Climate Change*.

Environmental Setting/ Affected Environment

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources. Meteorological and topographical conditions are also important—conditions such as wind speed, wind direction, and air temperature interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The study area encompasses three air basins: Sacramento Valley (SVAB), San Joaquin Valley (SJVAB), and the San Francisco Bay Area (SFBAAB). Each has a slightly different climate, and is subject to air quality regulations at the federal (Clean Air Act), state (California Air Resources Board), and local levels (regional air quality districts). The study area for GHGs is much broader due to the global nature of climate change.

Overview of Impacts and Mitigation

Each air quality management district has different emission thresholds, and was analyzed separately. Moreover, pollutants considered to have localized effects were analyzed using a study area defined by a thousand-foot radius from the construction and operational footprint. Regional operational thresholds were used to provide a conservative analysis of construction-related GHG emissions.

The analysis focused on the types of effects listed below.

- Conflict with or obstruction of implementation of the applicable air quality plan.
- Violation of any air quality standard or substantial contribution to an existing or projected air quality violation.
- Exceedance of the applicable air district thresholds for total direct emissions (including emissions that exceed quantitative thresholds for ozone precursors).
- Exposure of sensitive receptors to substantial pollutant concentrations. Sensitive receptors are schools, day care facilities, medical facilities, parks, and residences.
- Creation of objectionable odors affecting a substantial number of people.

Construction, operations, and maintenance of the water conveyance facilities would result in emissions generated by exhaust from construction and maintenance equipment and employee vehicles, dust from land clearing and earthmoving, and emissions from concrete batching. These emissions could have short- and long-term effects on air quality in the study area.

Restoration techniques that physically change the environment or that require the use of construction equipment would have short- and long-term air quality and GHG impacts.

Construction and maintenance equipment and vehicles would generate temporary emissions. Long-term air quality and GHG effects would result from changes in permanent, continued daily use of the Plan Area.

The analysis identified the impacts listed below associated with construction, operations, and maintenance of the proposed water conveyance facilities.

- Generating emissions in excess of local air district thresholds would violate applicable air quality standards and could contribute to or worsen existing air quality conditions. Criteria pollutant emissions would be reduced by implementing basic and enhanced construction emission control practices. Mitigation measures include creating offset reduction partnerships with air quality districts, payment of offsite mitigation fees, and providing grant funding for emission reduction projects. While mitigation would be available to reduce NOX (nitrogen oxide) emissions, feasible mitigation is not available to reduce fugitive dust emissions to acceptable levels.
- A proposed concrete batch plant under Alternatives 1B, 2B, and 6B could affect residences near the plant. Relocating the plant would meet air quality standards.
- Generating cumulative GHG emissions. Prior to construction, a GHG mitigation program to reduce construction-related GHG emissions to net zero would be developed and implemented. Emissions would be reduced to the maximum extent feasible; any remaining emissions from the project would be offset elsewhere by an equal amount of reductions.
- The CVP is operated using energy generated at CVP hydroelectric facilities, resulting in no GHG emissions. However, energy from other sources could indirectly result in increased GHG emissions; suppliers of this energy are beyond the control of the BDCP proponents. No feasible mitigation measures are available to fully reduce this potential indirect impact.

The analysis identified the following impact associated with restoration activities under CM2-CM11.

- An air quality mitigation plan would be developed to ensure that air district regulations and recommended mitigation are incorporated into restoration and enhancement project activities. Additional guidelines may be developed to ensure pollutants are reduced to the maximum extent possible.

Noise

Chapter 23, *Noise*, examines the potential impacts of noise and vibration resulting from construction and operation of the water conveyance facilities and restoration actions, specifically as they relate to regional city and county noise ordinances and restrictions for sensitive receptors.

Environmental Setting/ Affected Environment

Noise is measured in decibels (dB) and analysis considers sound exposure in noise-sensitive areas such as schools and daycare facilities.

The effects of noise on people fall into three general categories.

- Subjective effects of annoyance, nuisance, or dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as startling and hearing loss.

In most cases, sounds found in the natural environment are limited to the first two categories: creating an annoyance or interference with activities. No completely satisfactory method exists to measure the subjective effects of sound or to measure the corresponding responses of annoyance and dissatisfaction.

Overview of Impacts and Mitigation

Implementation of the BDCP or its alternatives could result in a potential increase in noise and/or vibration associated with the activities listed below.

- Construction of water conveyance facilities and power transmission lines, and restoration-related conservation measures.
- Truck trips and worker commutes.
- Conveyance facility operations.

Noise levels from construction and construction-related transportation would be expected to increase primarily in areas near intakes, tunnels or canal alignments, and forebay improvements. Mitigation measures, described below, would reduce these effects, but probably not to acceptable levels.

- Employ noise-reducing practices during construction: limit the hours of construction, specify equipment locations, prohibit unmuffled exhaust, shut down idling vehicles and equipment, erect noise-reducing enclosures and construction barriers.
- Prior to construction, initiate a complaint/response tracking program.
- Employ vibration-reducing practices during construction (e.g., locate equipment in more isolated areas, use alternative pile-driving methods).
- Prepare and implement a rail maintenance plan for reducing groundborne noise caused by tunnel locomotives.

Noise levels from pumping plant operations could be reduced to acceptable levels through the following mitigation measures.

- Design and construct intake facilities and other pump facilities to meet acceptable local noise standards. Examples of such measures are listed below.
    - Enclose noise-generating equipment in solid-wall structures.
    - Install acoustic access doors, wall panels, and ventilation louvers.
    - Use low-noise motors and transformers.
    - Place sound barriers (earth berms or constructed barriers) around noise sources.

Hazards and Hazardous Materials

Chapter 24, *Hazards and Hazardous Materials*, addresses both naturally occurring and human-caused hazards in the Plan Area. Other chapters that discuss hazard-related issues are Chapter 6, *Surface Water*, Chapter 8, *Water Quality*, Chapter 10, *Soils*, Chapter 9, *Geology and Seismicity*, Chapter 11, *Fish and Aquatic Resources*, Chapter 14, *Agricultural Resources*, Chapter 19, *Transportation*, Chapter 20, *Public Services and Utilities*, Chapter 22, *Air Quality and Greenhouse Gases*, Chapter 25, *Public Health*, Chapter 26, *Minerals*, Chapter 28, *Environmental Justice*, and Chapter 29, *Climate Change*.

Environmental Setting/ Affected Environment

Naturally occurring hazards include flammable gases such as methane generated in thick organic soils and peat; petroleum deposits; and fire hazards. Historic and current activities in and upstream of the Plan Area have resulted in hazardous materials in soils, sediments, and groundwater. Crude oil and natural gas pipelines traverse many parts of the Plan Area, with the potential to release these materials into the environment during the construction and operational phases of the proposed alternatives.

Some common agricultural practices present potential hazards: use, production, and storage of pesticides and fertilizers; on-farm storage areas, including above- and below-ground storage tanks, for petroleum products and agricultural chemicals; and waste disposal areas.

Potential hazards from mining activities and oil and gas production include abandoned or shut-in oil and gas wells, contaminated soil and groundwater from exploration and production, and infield and pipeline/transportation facilities.

A variety of urban, residential, and recreational uses have the potential to create hazards and introduce hazardous materials into the environment. Most common in the Plan Area are stormwater runoff and discharges; gas stations and auto repair; dry cleaners; manufacturing; marinas, boats, and related facilities; and camping facilities. Wildfire is a serious hazard in undeveloped areas of nonirrigated vegetation. Fires burn hot and rapidly, and combined with wind and hot, dry summers, they can be especially destructive.

Overview of Impacts and Mitigation

The analysis considered construction, operation, and maintenance of water conveyance facilities (CM1) and implementation of the other conservation measures, focusing on the following types of impacts.

- Release of hazardous materials during construction, operations, or maintenance of the conveyance facilities or other conservation measures.
- Release of hazardous emissions or handling of hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school or other sensitive receptor during construction of the water conveyance facilities.
- Disturbance of hazardous materials storage sites.
- Obstruction of air space of an airport or private airstrip.

- Exposure of people or structures to risk of wildland fire.
- Increased risk of bird-aircraft strikes as a result of improved wildlife habitat.

Impacts would be avoided through adherence to applicable federal, state, and local regulations, project-specific design, best management practices (BMPs), and environmental commitments. Implementation of environmental commitments and mitigation measures would reduce all these potential impacts, with the exception of bird-aircraft strikes. Environmental commitments include the development and implementation of Stormwater Pollution Prevention Plans (SWPPP) , Hazardous Materials Management Plans (HMMP), which would include a Spill Prevention, Containment and Countermeasure (SPCC) Plans, and Materials Reuse Plans.

Mitigation measures to address impacts are summarized below.

- Perform preconstruction surveys and predemolition surveys to test for known or suspected contaminants within the construction footprint and remediate and/or contain the contamination.
- Verify locations of utility infrastructure and relocate if necessary.
- Implement site-specific construction management plans.
- Consult with airports, USFWS, and relevant regulatory agencies to address bird strike hazard.

Public Health

Chapter 25, *Public Health*, addresses the following potential impacts on human health.

- Drinking water quality, as related specifically to human consumption.
- Accumulation of toxics in fish and aquatic organisms that are consumed by humans.
- Pathogens in recreational waters.
- Disease-carrying mosquitoes.
- Exposure to electromagnetic fields (EMFs) from transmission lines.

Chapters focusing on other public health and safety issues are: Chapter 6, Surface Water, Chapter 8, Water Quality, Chapter 22, Air Quality and Greenhouse Gas Emissions, Chapter 20, Public Services and Utilities, and Chapter 24, Hazards and Hazardous Materials.

Environmental Setting/ Affected Environment

The environmental setting/affected environment characterizes the public health considerations within the study area that could be affected by the construction and operations of CM1 through CM22. These considerations and their potential impact on public health include water quality, vectors that may carry diseases, and electromagnetic fields.

Overview of Impacts and Mitigation

The analysis focused on the types of impacts listed below.

- Substantial increase in the public's risk of exposure to vector-borne diseases.
- Exceedance of water quality criteria for constituents of concern in drinking water sources.

- Substantial increases of constituents known to bioaccumulate.
- Exposure of substantially more people to transmission lines and EMFs.
- Substantial increase in recreationists' exposure to pathogens.

The analysis identified the following impacts associated with construction, operation, and maintenance of the water conveyance facilities.

- The need for solids lagoons and sedimentation basins could lead to the creation of suitable mosquito habitat. The design and operation of these water bodies would, however, prevent the development of mosquito habitat: the water would be too deep and continuously moving to support larvae. No mitigation would be required.
- Causing increased amounts of disinfection byproducts, trace metals, and pesticides in drinking water that exceed water quality criteria. A series of phased actions would be undertaken to reduce bromide and degradation of water quality conditions, including evaluating modified operations, investigating water treatment system upgrades, developing other surface and groundwater supplies, and physically rerouting water. However, because these efforts may not be feasible or successful, the impact may not be reduced to acceptable levels.
- Certain restoration projects or activities could cause an increase in methylmercury and other constituents that tend to bioaccumulate in fish and other aquatic species and are dangerous for human consumption. Implementation of erosion and sediment control plans and a stormwater pollution prevention plan would help ensure that construction activities would not cause an adverse effect.
- More people could be exposed to EMFs through installation of new temporary and permanent transmission lines. The majority of new proposed lines would be constructed within the rights-of-way of existing lines or located in sparsely populated areas, away from areas where people gather. The impacts on public health would not require mitigation.

The following impacts could result from habitat restoration and enhancement activities.

- Pathogens could be generated in tidal and wetland areas, posing a public health risk to people engaged in recreational activities. The study area does not currently support pathogen concentrations that adversely affect recreation. Water quality modeling as discussed in Chapter 8 has indicated that the localized input of additional pathogens associated with restoration activities would not substantially increase human exposure.
- Increased surface areas of standing water could create new mosquito habitat and potentially increase the incidence of mosquito-borne diseases. Best management practices would be implemented in habitat restoration areas that could provide mosquito habitat. Some habitat restoration areas would provide increased habitat for mosquito predators. Habitat restoration and enhancement would not appreciably increase the public's risk of exposure to mosquito-borne diseases.

Mineral Resources

Chapter 26, *Mineral Resources*, describes existing mineral resources that could be affected by construction, operation, and maintenance of the water conveyance facilities and restoration activities within BDCP and its alternatives.

Environmental Setting/ Affected Environment

Mineral resources in the Plan Area consist of aggregate resources such as sand and gravel; non-fuel minerals (gold, silver, iron ore, clay, and lime); and oil and gas resources: gas fields, wells, and storage facilities.

In 2007, California ranked third in the nation for non-fuel mineral production, with a market value of $4.3 billion for approximately 30 industrial minerals. There were about 660 active mines, employing about 10,000 people. Most of the state's natural gas fields are in the Sacramento Valley. Since 2007, statewide oil production has declined to 1942 levels. Although oil is an important resource in California, oil extraction is not widespread in the Plan Area. Operational effects could result from the use of aggregate for maintenance. In general, however, the operation of the conveyance facilities would not affect the availability of mineral resources.

Restoration activities have been developed at a conceptual scale, only. Important mineral resource sites and mineral extraction operations were identified within potential restoration area footprints. The impacts would be discussed in greater detail in subsequent environmental documentation after the restoration activities are finalized.

Overview of Impacts and Mitigation

The analysis considered if construction, operation, and maintenance of the water conveyance facilities and restoration activities within BDCP and its alternatives could result in any of the types of effects listed below.

- Loss of a known mineral resource of value to the region or the state.
- Prevention of access to mineral resources.
- Reduction of extraction potential from natural gas fields.
- Reduced availability of aggregate resources and sites due to the volume used for construction.

Restoration activities—specifically those associated with CM4, CM5, and CM10—would affect two active aggregate mines and could inundate Decker Mine. Mitigation entailing purchase of the maximum permitted aggregate of the affected mines would reduce this impact acceptable levels.

Implementation of CM2-CM11 could affect a large number of locally important gas wells. If these wells were rendered inaccessible, this would be a major impact. Mitigation measures such as designing conservation projects to minimize abandonment or relocation of wells and ensuring that drilling access to natural gas fields is maintained to the greatest feasible extent, this impact would not be fully reduced.

Construction of conveyance facilities could necessitate the relocation of some natural gas distribution lines (lines from individual wells to larger collection lines). However, because these relocations would not affect gas production, this impact would be less than significant, and no mitigation is required.

Paleontological Resources

Chapter 27, *Paleontological Resources*, considers the potential effects on fossils: the remains, traces, imprints, or life history artifacts of prehistoric plants and animals that may be present in the Plan Area. Fossils are considered nonrenewable scientific and educational resources.

Environmental Setting/ Affected Environment

The Plan Area is characterized by a complex history of sedimentation. Areas that have been heavily disturbed are not likely to yield important paleontological resources, because even if such resources are present, they have been disrupted from their context. The areas of greatest paleontological sensitivity are along the eastern, southwestern, and northwestern portions of the Plan Area.

Overview of Impacts and Mitigation

The analysis considered if implementation of BDCP and its alternatives would directly or indirectly destroy a unique paleontological resource or site. Ground-disturbing activities are of primary concern for this resource.

Operation and maintenance of the water conveyance facilities as described in the BDCP and its alternatives would not involve extensive ground-disturbing activities, nor would they substantially increase erosion over current conditions. Consequently, paleontological resources would not be disturbed. Similarly, implementation of CM11–CM22 would have no effect on paleontological resources because they would not entail ground-disturbing activities.

However, construction of water conveyance facilities under all alternatives could destroy unique or significant paleontological resources. While mitigation measures could reduce the effects of surface-related ground disturbance for surface activities, impacts of other actions, such as tunnel boring, may not be fully reduced.

Excavation activities to implement CM2 and CM4-CM10 could destroy unique or significant paleontological resources. Mitigation measures would reduce these impacts.

- Before ground-breaking construction begins, prepare a monitoring and mitigation plan for paleontological resources to ensure that unique or scientifically significant resources are systematically identified, documented, avoided, or protected from damage where feasible, or recovered and curated so they remain available for scientific study.
- Review 90% design submittal to finalize identification of construction activities and how the mitigation measures would be applied to various phases of construction.
- Educate construction personnel to recognize fossil material.
- Collect and preserve substantial fossils remains when encountered.

Environmental Justice

Chapter 28, *Environmental Justice*, addresses the potential for implementation of BDCP or its alternatives to disproportionately affect minority and low-income populations. This analysis is a federal requirement; CEQA does not require such an analysis.

Minority populations include American Indian or Alaskan Native, Asian or Pacific Islander, Black, and Hispanics. Low-income populations are defined by poverty thresholds provided by 2010 U.S. census data.

Environmental Setting/ Affected Environment

Public outreach is central to meeting the identified goals for environmental justice. Minority and low-income populations in the affected area must be provided with adequate opportunities to participate in the NEPA process. Their participation is important to assessing the significance of impacts and mitigation measures. Many efforts were made to engage minority and low-income populations.

- An environmental justice plan was prepared to guide public outreach activities.
- Scoping meeting notifications were published in ethnic newspapers and aired on ethnic radio stations.
- Scoping meetings in affected communities were held during evening hours.
- Translators were provided at public scoping meetings.
- The BDCP website is translated into Spanish.
- A multilingual informational hotline provides project information in English, Spanish, Tagalog, Vietnamese, and Chinese (Mandarin).

Overview of Impacts and Mitigation

The analysis focused on the types of impacts listed below.

- Any impact on the natural or physical environment (such as health, economic, cultural, or social impacts) when the minority population is greater than 50% of the population or low-income individuals constitute 20% or more of the population.
- Effects that appreciably exceed the adverse impacts on the general population.
- Effects that would result in cumulative or multiple adverse exposures to environmental hazards appreciably exceeding the effects on the general population.

Each of the action alternatives would result in disproportionate effects on minority and low-income populations in the Plan Area. There is potential for disproportionate adverse effects on these populations.

- Displacement of residences and residents would result from construction of the proposed water conveyance facilities, particularly the intake facilities. Construction activity has the potential to divide existing communities for several years. Mitigation measures would require the development and implementation of a site-specific traffic management plan and temporary alternate access routes.

- While construction of conveyance and related facilities would increase total employment and income in the study area, the conversion of agricultural land would result in the direct loss of farming jobs. The majority of farm labor in the study area is held by minority and potentially low-income individuals. It is unlikely that new construction jobs would be filled by displaced agricultural workers.
- Temporary and permanent visual effects would result from construction and operations. Long-term mitigation measures include landscaping, burying transmission lines, and visual barriers. However, some scenic resources would be permanently altered.
- Construction has the potential to damage identified and previously unidentified archaeological and historic resources, as well as traditional cultural properties. Many of these resources have particular significance to Native American and other minorities. Mitigation measures can reduce the effects; these are thoroughly described in Chapter 18, Cultural Resources. The effect on minority populations would remain disproportionate because of the importance of these resources to minority populations, and because mitigation cannot guarantee that all resources would be avoided.
- Proposed heavy construction sites are near areas where a greater concentration of low-income and minority populations reside. Diesel exhaust emissions from heavy machinery during construction and off-road vehicles used in conservation activities could exceed air quality standards and disproportionately affect minority and low-income populations. Replacing diesel-powered equipment with electric vehicles and installing diesel filters on diesel engines would reduce the severity of the impact.
- Vibration and noise are predicted to exceed noise standards for minority and low-income populations residing in the vicinity of the heavy construction work areas. Noise abatement measures would reduce the temporary effects but would not eliminate them entirely.

Climate Change

Chapter 29, *Climate Change*, addresses the question of how the Draft BDCP EIR/EIS or its alternatives would affect the resiliency and adaptability of the Plan Area to the effects of climate change. Resiliency and adaptability mean the ability of the Plan Area to remain stable or flexibly change as the effects of climate change increase, in order to continue providing water supply of suitable water quality and to support ecosystem conditions that maintain or enhance aquatic and terrestrial plant and animal species. The function of Chapter 29 differs from the other resource chapters, which identify the effects of actions within BDCP and its alternatives and how to mitigate the effects of those actions.

Projections of future climate change are based on the level of GHGs already in the atmosphere, the current rate at which human activity releases GHGs to the atmosphere, and the future rate of GHG emissions,

which in turn relies on predictions of future population, global economic growth, future available energy sources, and regulations. Consequently, future projections of climate change are typically displayed as a range, with the lower end representing a minimum amount of estimated change based on past and current GHG emissions and the higher end representing a high degree of global economic growth and the absence of large-scale mitigation of GHG emissions.

The impact of the BDCP alternatives on climate change—specifically, how GHG emissions from the alternatives would contribute to elevated GHG concentrations in the atmospheres—is analyzed in Chapter 22, *Air Quality and Greenhouse Gases*.

Recent Trends and Projections

During the period 1920–2003, average annual temperature in the Plan Area region has increased approximately 0.9°F, and local annual precipitation has increased by approximately 1.7 inches. Sea level in San Francisco Bay has risen approximately 7 inches over the last 100 years, affecting high tide and salinity levels in the Delta. Average annual snowpack in the Sierra Nevada has decreased by about 10% in the last 100 years, a loss of 1.5 MAF of snowpack storage.

By 2060, average annual temperatures in the Plan Area are projected to increase by another 3°F. Average annual precipitation is projected to decrease slightly, by approximately 0.16 inch. While the amount of precipitation may only change slightly, more frequent rainfall and less frequent snowfall are projected, meaning less accumulation of snowpack. Sea level rise along the San Francisco coast is expected to increase by 5–24 inches by 2050 and as much as 17–66 inches by 2100, subjecting more land in the Plan Area to inundation, and affecting salinity and suitable species habitat in the Delta.

Climate and Climate Change

Climate is the average weather over many years, measured most often in terms of temperature, precipitation, and wind. Climate is unique to a particular location and changes on timescales of decades to centuries or millennia. Climate change generally means a statistically significant variation in conditions, lasting for a period of decades or longer. Recent climate change has been more rapid than previous episodes, and is directly linked to increasing concentrations of greenhouse gases and the rapidity with which these gases have accumulated. The major causes of this rapid conversion are the burning of fossil fuels, agricultural practices, increases in livestock grazing, and deforestation.

Resiliency and Adaption

Sea level rise and hydrology changes could have the following results.

- Reduced flow in to the Delta could increase salinity, decrease water quality, and shrink or redistribute habitat. These changes could adversely affect water supply reliability and aquatic species, would pose significant challenges and constraints to water management, and are expected to result in more years of critical dryness. BDCP Alternatives 1A-5 would provide substantial resiliency and adaption benefits over the No Action Alternative for dealing with sea level rise and changes in upstream hydrology, providing more flexibility for adaptive management.

Alternatives 7 and 8 could also provide more management flexibility. Alternatives 6-8, however, would slightly decrease Delta exports and water deliveries. CM2-CM22 would improve habitat and reduce the effects of stressors on the Delta ecosystem, improving the health of the ecosystem and individual species and making them more resilient to the effects of climate change.

- The additional impact of more frequent extreme precipitation events would likely affect terrestrial habitat and species. Higher sea levels would inundate existing low-lying habitat, potentially destroying habitat and increasing mortality. Measures in BDCP alternatives to restore and protect habitat would allow resource managers to plan for habitat changes, providing greater resiliency and adaptability. Habitat connectivity and increased size of plots would increase populations of native species.
- Increased water levels would affect Delta levee stability and reliability by placing additional stress on fragile Delta levees, increasing the likelihood of levee failures. Levee failure could lead to substantial salinity intrusion and interrupt water supplies. Salinity intrusion could also have a major impact on aquatic species habitat. Only Alternative 9 would add additional resiliency to the Delta by strengthening and reinforcing levees critical to the through-Delta conveyance route. Alternatives 1 through 8 would provide additional adaptability to catastrophic failure of Delta levees by providing an alternative conveyance route around the Delta for water deliveries.

Increased air and water temperature could have the following results.

- Increased air temperatures would lead to increased evapotranspiration, increasing the water demand for crops and vegetation. Increased evaporation may also reduce water supplies in open facilities such as reservoirs and canals. Alternatives 1A through 5 would improve water supply reliability, providing additional resilience and adaptability to increases in water demand. Alternatives 6A through 9 would reduce water supply reliability, as well as resiliency and adaptability to climate change impacts.
- Increased water temperatures would decrease suitable summer habitat for delta smelt. Warmer streams and rivers would also facilitate colonization by invasive species. By creating a wider variety of water management options and restoring habitat on a large scale, BDCP and its alternatives would help buffer the potential adverse effects of increased water temperatures.

Growth Inducement

Chapter 30, *Growth Inducement*, addresses the direct and indirect growth inducement potential of implementing BDCP or its alternatives.

Environmental Setting/ Affected Environment

Increasing the reliability of the state and federal water projects is one of the objectives of the BDCP. Water supply supports urban development and agricultural production.

Although adequate water supply, treatment, and conveyance play a role in supporting additional growth in areas dependent on this water supply, many other factors influence growth, such as employment opportunities; public services and infrastructure; local land use policies; and land use constraints such as floodplains, seismic risk, and sensitive habitat areas.

Overview of Impacts

Assessing growth inducement potential involves determining whether implementation would directly or indirectly support economic expansion, population growth, or residential construction, and if so, determining the extent of the potential environmental effects of that growth. Although some of these effects could be characterized as direct effects, most are indirect. Direct effects are caused by the action at the time and place the project is occurring. Indirect effects can occur later in time and at a distance from the action, but they are still reasonably foreseeable. Indirect effects can include land use changes, population density, or growth rate, and effects on air, water, and ecosystems.

Direct growth potential was analyzed by comparing the number of potential new jobs with the labor force in the Delta vicinity and evaluating the capacity of the local labor force to meet project-generated employment demand.

Indirect growth potential was evaluated by projecting the potential for implementation of BDCP and its alternatives to stimulate housing development and increased need for public services through increased water deliveries to state and federal contractors; improved roadway infrastructure; and reduced risk of flooding. The potential for growth was assessed for consistency with local land use plans. The analysis considered the relationship between water supply and urban population growth, and whether growth would occur without increased water deliveries.

Direct Impacts

Depending on the alternative, construction of the BDCP would require approximately 4,390 construction workers over an 8-year period, and approximately 190 permanent operations and maintenance workers. These workers would largely come from the local labor pool and are not expected to generate substantial new housing development.

Indirect Impacts

Proposed new roads would not provide access to substantial areas of undeveloped or agricultural lands.

The potential for increased water deliveries varies by alternative and operational scenario, increasing and decreasing by hydrologic region, water rights, and contracts. The number of factors other than water supply that influence growth makes it difficult to assume a level of projected growth, where growth might occur, and related impacts. State, federal, and regional agencies can protect environmental resources and ensure that planned development occurs in a sustainable manner, but unavoidable impacts associated with growth would be expected to occur.

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PROGRESS IN ACHIEVING THE CO-EQUAL GOALS

An unprecedented level of public review, comment, and scientific input has helped refine and improve the BDCP. The following is a snapshot of major milestones that have helped refine the proposed project.

CO-EQUAL GOALS

WATER SUPPLY RELIABILITY

RELIABLE WATER SUPPLIES FOR
25 MILLION
CALIFORNIANS

1 MILLION
CALIFORNIAN JOBS
PROTECTED / CREATED

MODERNIZED WATER SYSTEM THAT PROTECTS SUPPLIES FROM EFFECTS OF CLIMATE CHANGE

ECOSYSTEM RESTORATION

150,000 (APPROX)
ACRES OF RESTORED AND PROTECTED HABITAT

56
PROTECTED SPECIES

IMPROVED FLOW CONDITIONS TO BENEFIT FISH IN THE DELTA

PUBLIC INVOLVEMENT & INPUT

MEETINGS

MORE THAN
400
PUBLIC MEETINGS & BRIEFINGS

14
OPEN IN-DELTA "OFFICE HOUR" BRIEFINGS

12
PUBLIC COMMENT PERIOD OPEN HOUSE MEETINGS

MORE THAN
40
WORKING GROUP MEETINGS

INFO & MATERIALS

RESPONDED TO
37
#whereinBDCP TWEETS

PROVIDED MORE THAN
5,500
COPIES OF HIGHLIGHTS, EXECUTIVE SUMMARIES, DVDs, COMMENT CARDS & FAST FACTS
(COMBINED)

20
INFORMATIONAL VIDEOS

POSTED
76
ANSWERS TO FREQUENTLY ASKED QUESTIONS

6
MULTI-LINGUAL FACT SHEETS

16
BLOG POSTS

BDCP PROGRESS

AUGUST 2014

- Agency review of public comments, project refinements
  - Newsletter: Planning for Climate Change
  - Blog: Refinements Warrant Additional Public Review
- Lead agencies announce Partial Recirculation of Draft Environmental Impact Report (EIR)/ Supplemental Draft Environmental Impact Statement (EIS)to address project changes

JULY 2014

- Close of the 228-day Public Review and Comment Period on Draft BDCP and Associated Environmental Impact Report / Environmental Impact Statement

10,000+
COMMENT LETTERS RECEIVED

JUNE 2014

- BDCP could create and protect 1,135,812 California jobs
  - Infographic: Job Creation & Protection
  - eNewsletter: How Many Jobs will BDCP create?
  - eNewsletter: Reliable Water for about $5 / mo
  - Episode: Jobs & Local Economic Benefits
- Informational video featuring visual simulations of Water Conveyance Facility
  - Visual Animation & Presentation: Water Conveyance Facility

OCT '14
SEP '14
AUG '14
JUL '14
JUN '14

MAY 2014

- BDCP affordability for urban ratepayers: costs as low as $2-3 per month for some water users
  - Report: LA Office of Public Accountability
- BDCP Proponents Agree on Draft Implementation Strategy, open for 60-day public review period
  - News: Agreement & Comment Extension
- DWR Establishes the "BDCP Office" and "Design and Construction Enterprise" to Guide BDCP Implementation
  - Blog: Principles for Sharing Design and Construction Oversight for Proposed New Water Facilities

FEBRUARY 2014

- Public Review and Comment Period Extension
  - News: Draft BDCP & Comment Extension

JANUARY 2014

- Final California Water Action Plan released
  - Website: State Water Action Plan
- Governor Brown declares Drought State of Emergency
  - News: Declaration Press Release
- BDCP holds 12 public open house meetings throughout the state to collect comments on the draft documents and answer questions
- Distribution of highlights, DVDs and response tweets to #whereinBDCP

OCTOBER 2013

- BDCP would not take more water: BDCP would modernize our current system
  - Video: How Much Water

AUGUST 2013

- Project footprint reduced by one-half; local impacts reduced
  - News: Changes to BDCP Would Reduce Impacts to Landowners and Residents
  - Fact Sheet: BDCP Refinements Respond to Community and Statewide Needs
- BDCP: An Economic Investment for California
  - BDCP Statewide Economic Impact Report

MAY 2013

- BDCP Administrative Draft EIR/EIS available for public review

MARCH 2013

- Preliminary Draft BDCP available for public review

JULY 2012

- Governor Brown outlines revisions to the BDCP: Intake capacity reduced from 15,000 cubic feet per-second (cfs) to 9,000 cfs
  - California's Water Future Framework Brochure

ADDITIONAL INFORMATION

A full listing of links used in this document can be found online at: www.BayDeltaConservationPlan.com

MAY '14
APR '14
MAR '14
FEB '14
JAN '14
DEC '13
NOV '13
OCT '13
AUG '13
MAY '13
MAR '13
JUL '12

NEED HELP FINDING INFO? CONTACT US ON TWITTER AT: #WhereInBDCP?

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Để biết thêm thông tin, xin gọi số

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BDCP
BAY DELTA CONSERVATION PLAN

California's Future Depends on Delta Water Supply

March 2013

The importance of the Delta to statewide water supplies cannot be overstated.

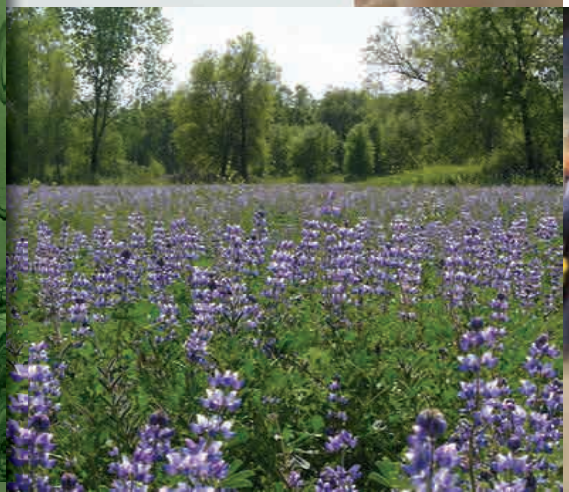
Two out of three Californians and 3 million acres of farmland receive some water from the Delta.

Fresh water that reaches the Delta from the Sierra Nevada mountains serves businesses and homes from Silicon Valley to San Diego County.

The Sacramento-San Joaquin River Delta (Delta), located east of San Francisco Bay, is a vast and vitally important ecosystem to California. The Delta is home to hundreds of aquatic and terrestrial species—some unique to the area—as well as more than 500,000 people, a thriving agricultural economy, and a distinctive recreational resource.

Equally important, the Delta provides water for 25 million Californians and supplies an agricultural industry that, in turn, feeds millions. Water from the Delta irrigates farms where much of the nation's domestic produce is grown. Delta water powers the California economy. We cannot thrive without it.

Here's the problem that all Californians face: **The Delta has been stretched to a breaking point**. The ecosystem is in steep decline and has put the water that millions of Californians depend on at risk. Environmental restrictions on water deliveries are meant to protect Delta fish species, but have also greatly reduced the flexibility to meet statewide water supply needs.



The BDCP Can Solve the Delta's Problems
and Provide Reliable Water Supply, Economic Susta

A team of federal and state water experts, scientists, and public water a
The resulting Bay Delta Conservation Plan (BDCP) will balance the need

The BDCP is a comprehensive conservation strategy aimed at protecting do
two biggest water delivery projects.

The direct benefits of the BDCP to water users—reliable export volume, reduced regulatory and legal uncertainty, improved water quality, reduced seismic risk to water supplies—exceed the costs of BDCP.

To **secure water supplies** and **protect the economy**, the BDCP will:

- Provide water managers with a reliable and predictable amount of water
- Protect against water supply disruptions for 66 percent
  of the state's population
  - Protect water supplies from catastrophic failure due to earthquakes or failed levees
  - Boost the state's ability to respond to drought and climate change
  - Create 137,000 jobs
  - Isolate water supplies from increasingly stressed Delta levees
- Implement ecologically friendly ways to move California's drinking and irrigation water under the Delta to secure water supplies for California homes, businesses, and farms

To restore a **healthy Delta ecosystem**, the BDCP will:

- Improve the overall ecological health of the Delta
- Reverse the trend of habitat loss and help recover declining populations of native species
- Address habitat needs for 11 fish species and 46 wildlife and plant species
- Improve natural flow conditions for fish and wildlife
- Implement an accelerated habitat restoration program by creating 30,000 acres of aquatic habitat in the next 15 years
- Reconnect floodplains and rivers
- Return degraded riverbanks to a more natural state
- Improve water quality
- Control invasive species

As the Delta ecosystem improves in response to BDCP implementation, water operations will become more reliable and secure.

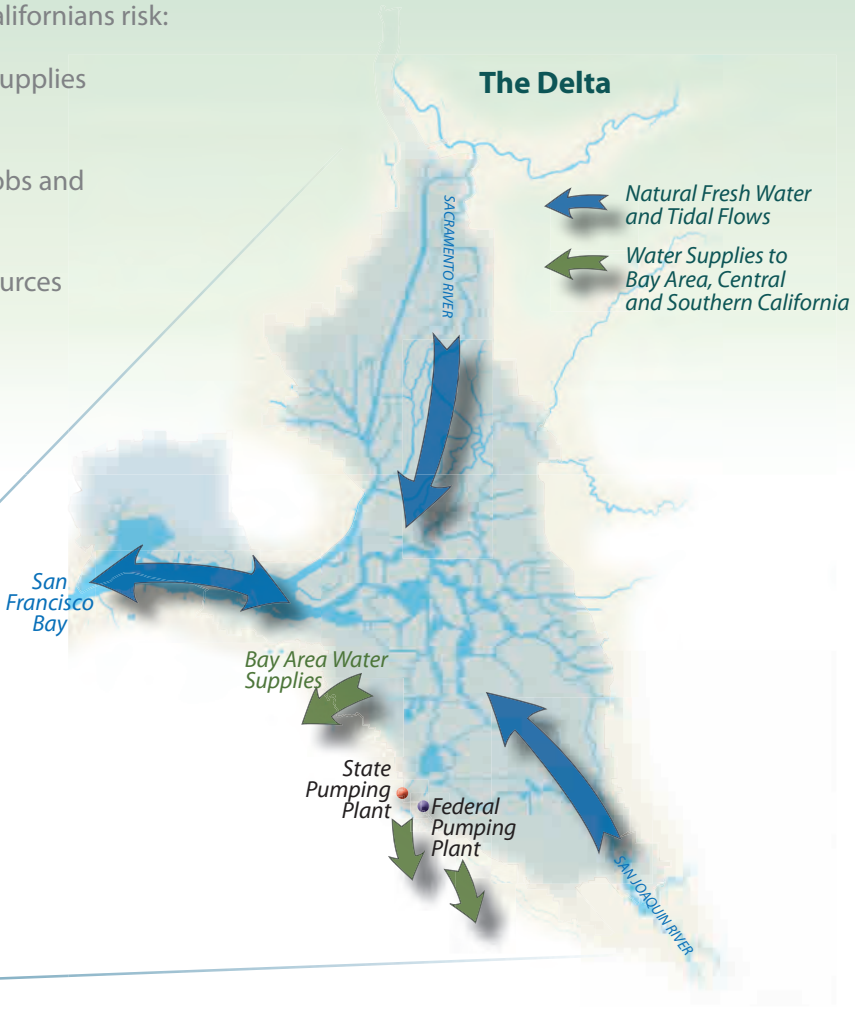
BDCP
Bay Delta Conservation Plan

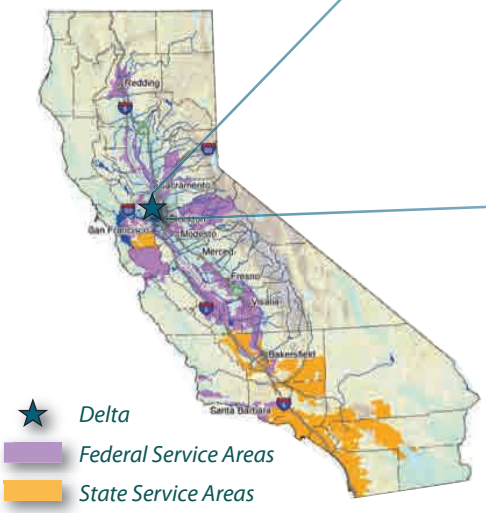
What's at stake?

The heart of California's water system rests in the Delta, and its current configuration is at risk of failure. Without changes to the way water currently flows through the Delta, Californians risk:

- A loss of secure and reliable drinking water supplies for millions of people
- Damage to the statewide economy, loss of jobs and loss of business
- Further degradation of precious natural resources and extinction of native species

BDCP would environmentally retrofit, modernize, and restore greater flexibility to the state's water system.





The state's two most important water delivery systems are located in the Delta: the federal Central Valley Project, operated by the United States Bureau of Reclamation, and the California State Water Project, operated by the California Department of Water Resources.

The future of reliable, high-quality water supplies for Californians depends upon a healthy Delta ecosystem and critical upgrades to the Delta's water delivery infrastructure.

The BDCP s intent to ensure the coequal goals of ecosystem recovery and water supply reliability serves the entire California community, not just part of it. The BDCP is based on science, environmental research, and economic realities. The agencies preparing the BDCP welcome public input.

For more information, visit:
www.baydeltaconservationplan.com

Bay Delta Conservation Plan
Substantive Changes in Public Draft (Dec 2013) since Revised Administrative Draft (March -May 2013)

Chapter 3: Conservation Strategy			
3.1.3	Adaptive Management and Monitoring Program	3.1-4 thru 6	• Clarified process to modify conservation measures to meet goals and objectives to be consistent with Section 3.6
3.2.4.2.2	Existing Conservation Lands	3.2-25 thru 27	• Updated GIS data with newly available datasets • Updated classification status of open space conservation lands according to protection and resource management objectives
3.2.5	Landscape Linkages	3.2-28 thru 32	• Added section to describe how the conservation measures provide spatial and temporal habitat connectivity and linkages for breeding, feeding, or roosting • Added Table 3.2-3 to outline the linkages, species benefitting, and applicable conservation measures
3.3.1	Role of the Biological Goals and Objectives in Plan Implementation	3.3-2 3.3-3 3.3-3 thru 4 3.3-6 thru 35 3.3-38	
3.3.6	Natural Community Biological Goals and Objectives	3.3-53	• Updated estimates and rationale in Table 3.3-2 (Expected Extent of Conserved Natural Communities in Plan Area with BDCP Implementation) • Deleted Table 3.3-4 (Existing Condition and Estimated Restoration and Protection—Wildlife and Plants)
3.3.7	Species Biological Goals and Objectives	3.3-100 and throughout Tables 3.3-7 and -8 (p.304 and p 337)	• Updated references and supporting documentation for the goals and objectives • Clarified, added, deleted, and/or simplified the objectives for a number of goals for the covered species, particularly applicable natural community goals and/or objectives • Clarified conservation strategies for a number of species. • Clarified and/or simplified stressors for a number of species goals and objectives, and added recent research and documentation of the stressor roles • Deleted descriptions an documentation of biological goals and objectives for California least tern (species dropped from coverage) • Updated estimates of the distribution/occurrence of vernal pool crustacean and plant species

Section	Section Title	Page Number(s)	Summary of Change
3.4.1	CM1 Water Facilities and Operation	3.4-24 thru 26 3.4-14 thru 23 3.4-26 thru 29	• Updated Decision Tree section on how decisions are made. • Clarified that the permits may include operational flow criteria related to high-outflow scenario • Update real-time operations section to clarify roles and procedures • Updated description of water facility construction to reflect optimized alignment
3.4.2	CM2 Yolo Bypass Fisheries	3.4-57 thru 58	• Replaced Table 3.4.2-1 for operations of Fremont Weir gated channel and other concerns
3.4.3	CM3 Natural Communities Protection and Restoration	3.4.3-7 thru -26 3.4.3-42 thru -57	• Added section on overlap of Plan Area and other HCPs • Updated landscape linkages section • Updated Table 3.4.3-1 (Nat. Communities siting and reserve design requirements) • Added brush rabbit objective and California black rail and giant garter snake goals and objectives, and expanded two greater sandhill crane objectives
3.4.4 thru 3.4.21	CM4 – CM21	General changes	For most CMs (CM4-CM21) • Updated background information on overall rationale, and potential benefits by species in response to fish and wildlife agency comments • Updated effectiveness monitoring, and biological goals and objectives in tables for each CM • Updated the related monitoring actions table for each CM, including timing and duration of monitoring, and clarification of how the conservation measures advance the biological goals and objectives by species • Important updates to CM21 to clarify its implementation
3.4.4.4	CM4: Adaptive Management and Monitoring	3.4.4-22 thru -33	• Added tidal restoration feasibility section • Updated Table 3.4.1-1 for CM4 schedule
3.4.4.35	General Enhancement and Management Actions; Aquatic and Emergent Wetland Natural Communities; Cultivated Lands; Managed Wetlands	3.4.4-101 thru -108 3.4.4-110 thru -112 3.4.4-129 thru -130 3.4.4-131 thru -136	• CM11 - added Recreation and Levee Maintenance sections to General Enhancement and Management Action section - Added greater sandhill crane and California black rail habitat enhancement and management details to Aquatic and Emergent Wetland Natural Communities section - Added Emergency Spillway Associated with Glanville Tract Forebay operation section as it relates to managed habitat for greater sandhill crane. - Updated the enhancement and management actions in the Managed Wetlands section, including new actions related to several species
3.4.22	Conservation Strategy	Table 3.4.1-1 Pages 3.4.22-10 thru -11	• Updated AMM descriptions • Added AMMs for protection of natural communities and covered species, and recreation • Additional details are described below under Appendix 3C
3.4.23	Resources to Support Adaptive Management	3.4-354 thru 357	• New section describing supplemental resources available for adaptive management, including: Inter-annual adjustments to operations Water supply sharing Redirected funding to maximize CMs Enhanced environmental flows Supplemental adaptive management fund
3.6	Adaptive Management and Monitoring Program	3.6-19 thru 25	• Revised details of adaptive management and monitoring programs and procedures regarding decision making, roles and responsibilities, and decisions subject to the process
Chapter 4: Covered Activities			
Chapter 4	Covered Activities and Associated Federal Actions	4-8 thru 21	• Added updates to project facility design, including facility footprint estimates, water conveyance sizes, and clarified construction activities. • Added detail for intermediate forebay, expanded Clifton Court

Section	Section Title	Page Number(s)	Summary of Change
			Forebay, concrete batch plants, barge landing locations, electric power delivery systems, material storage site specifics, additional details on operation procedures, and levee modification and construction details.
		4-34 thru 37	• Added details regarding CM2 schedule, implementation plans, phases
		4-42 thru 70	• Clarified CM3-CM11implementation
		4-70 thru 74	• Added new section and details on recreation facilities in the reserve
		7-74 thru 96	• Clarified CM12-CM21implementation
Chapter 5: Effects Analysis			
5.2.7	Effects Analysis for Covered Fish	5.2-17 thru 21 5.2-37 thru 47	Added clarification updates to: • Table 5.2-5 (Models Used in the Effects Analysis for Covered Fish Species), and • Table 5.2-8 (Biological Objectives for Covered Fish Species and their Assessment in the Effects Analysis)
5.5	Effects on Covered Fish	5.5-1 thru 2 5.5.1-5 thru 14 5.5.1-15 thru 25 5.5.1-25 throughout depending on species	• Added explanation of effects ranking process • Added details regarding BDCP effects based on updated modeling data (flow effects) • Added details regarding the Fall X2 Decision-Tree Process as it relates to delta smelt conservation and management, including recent monitoring results and uncertainties • Added details on reverse flows • Added details on effects on salmon survival • Added better/more refined food analysis for aquatic species • Added details on recent research and evaluations for covered species • Outlined the potential or expected effects of the BDCP on the covered species, based on updated modeling results. • Added details regarding the Spring Outflow Decision-Tree Process for guiding initial spring outflow conditions to benefit longfin smelt.
Chapter 6: Plan Implementation			
6.1.1	Performing Implementation Actions	6-2 thru 6	• Updated implementation schedule of other stressor conservation measures (Table 6-1) and natural community restoration (Table 6-2). • Added Post-Permit Term Implementation section
6.2	Interim Implementation Actions	6-12 thru 21	• Updated status of interim conservation actions.
6.3	Planning, Compliance, and Progress Reporting	6-21 thru 27	• Updated planning, compliance, reporting, and review requirements
6.4	Regulatory Assurances, Changed Circumstances, and Unforeseen Circumstances	6-28 thru 30	• Added section on obligations of the parties pursuant to regulatory assurances section
6.4.2	Changed Circumstances Related to the BDCP	6-30 thru 45	• Add new changed circumstances: drought, disease, and vandalism of reserves
6.4.4	BDCP Relationship to Significant Future Projects or Governmental Regulations	6-45 thru 47	• Added section on BDCP relationship with significant new projects or regulations
Chapter 7: Implementation Structure			
7.1	Roles and Responsibilities of Entities Involved in BDCP Implementation	7-3 thru 4	• Added Table 7-1(BDCP Governance Decision-making) which outlines key decisions, who makes them, who has input, and which are subject to dispute review process described in Sect. 7.1.7
7.1.6	Adaptive Management Team	7-15 thru 16	• Clarified voting vs. non-voting members of the Adaptive Management Team. • Updated various sections for consistency with updated Adaptive Management Program in Section 3.4

Section	Section Title	Page Number(s)	Summary of Change
7.1.7	Elevation and Review of Impl. Decisions	7-16 thru 17	• Clarified the dispute resolution process for the Authorized Entity Group, Permit Oversight Group, and their member agencies
7.2.8	Coordinating with Local Governments, Delta Protection Commission, and Other Public Agencies	7-26	• Clarified coordination process with local conservation plans, and identified uncertainties still needing resolution
Chapter 8: Cost and Funding Sources			
8.2.2.3	Financial Assumptions	8-4 thru 9	• Clarified cost estimates in both undiscounted and discounted dollars
8.2.3	Conservation Measure Costs	8-11 thru 52 8-78 8-81 thru 82	• Updated all costs to reflect new optimized alignment and to adjust costs of some conservation measures in response to CDFW comments • Clarified data, methods, and assumptions for costs of conservation measure implementation. • Adjusted land acquisition cost estimates and assumptions for CM1-CM22 • Clarified property tax and assessment revenue replacement impacts and adjusted cost estimates
8.4	Funding Assurances		• Clarified actions available in response to potential state or federal funding shortfall
Chapter 9: Alternatives to Take			
9.1.4.1	Relationship Between the Take Alternatives and the Alternatives in the EIR/EIS	9-10 thru 11	• Clarified how the EIR/EIS alternatives were modified to incorporate the same operational conditions criteria included in the BDCP Proposed Action (e.g., high-outflow scenario, south Delta operations)
9.2	Descriptions of Take Alternatives	9-17 9-27 thru 28 9-30 thru 32	• Updated Table 9-4 to include an expanded Clifton Court Forebay component to several Take Alternatives. • Clarified that Take Alt D is a dual bore tunnel • Revised the levels of take or benefits from conservation measures • Included greater specificity of expected effects from Take Alternative F (Through-Delta)
9.3	Methods of Analysis	9-35 thru 44 9-45 9-48 thru 49 9-50 thru 183 depending on species 9-198 thru 199	• Provided additional details for assessing the extent that Take Alternatives would meet the BDCP goals • Changed focus of seismic risk analysis to modeled differences in water supplies under no-earthquake and post-earthquake conditions across urban and agricultural sectors • Added Resource Impact mechanisms (Table 9-9) for assessing differences between the Take Alternatives and the BDCP • Re-assessed expected incidental take for each Take Alternative relative to the BDCP proposed action for each covered species and effect mechanism • Revised assessment of Take Alternative F (through-Delta) • Updated the cost practicability analysis, with new cost data
Appendices			
Appendix 1A	Covered Species Evaluation		• Dropped California least tern as a covered species because the two breeding colonies in the Plan Area would not be affected by covered activities

Appendix 2A	Species Accounts		• Updated species accounts with recent data, relevant to the Plan Area and BDCP covered activities
Appendix 2B	Vernal Pool Mapping		• Clarified modifications made to the vernal pool complex mapping process, based on review team assessments of the initial 2009 analysis
Appendix 3A	Background on Conservation Measures		• Added a table describing the weighting factors for assessing the suitability of areas for tidal marsh restoration activities
Appendix 3C	Avoidance and Minimization Measures		• Added detailed processes for the beneficial use provisions for RTM • Clarified design process to minimize effects on covered species such as vernal pool crustaceans and California tiger salamanders • Clarified survey and mitigation implementation procedures for unavoidable effects on covered terrestrial species or habitat such as requirements for mitigating the removal of nesting, roosting and foraging habitat for avian species (particularly raptors, cranes) • Clarified and updated protocols for SWPPP and SPCC • Clarified protocols for powerline installations to minimize avian effects
Appendix 3C	Avoidance and Minimization Measures		Added AMMs for: • selenium management, geotechnical studies • design standards and building codes, transmission line guidelines • noise abatement, hazardous material management • mosquito management, construction site security • fugitive dust control, and recreation
Appendix 3D	Monitoring Actions	CM1, 5, 6, 7, 8, 10, 11, 12, 14, 16, 17, 19, 21	• Revised and updated compliance and effectiveness monitoring actions to be more specific where feasible • Replaced the effectiveness monitoring action for effects of intake operations on fish species, with several more specific measures.
Appendix 5B	Entrainment		• Updated modeling results and added modeled scenarios to account for the decision-tree process
Appendix 5C	Flow, Passage, Salinity, and Turbidity		• Updated modeling results and added modeled scenarios to account for the decision-tree process • Added bypass flow rules for CALSIM modeling.
Appendix 5D	Contaminants		• Updated modeling results for mercury, methylmercury, and selenium with the added modeled scenarios accounting for the decision-tree process, assessing future conditions with and without BDCP.
Appendix 5E	Habitat Restoration		• Updated modeling results of habitat suitability and benefits to covered fish species from habitat restoration under the added modeled scenarios accounting for the decision-tree process, assessing future conditions with and without BDCP. • Deleted discussion of specific Sacramento splittail benefits
Appendix 5F	BioStressors		• Added clarification of Adaptive Management Team responsibilities for assessing biostressers on Chinook and other covered fish species, particularly losses due to predation and intake operations
Appendix 5G	Fish Life Cycle Models		• Deleted information and results from two models: -OBAN for SR Chinook -State Space Multistage Delta Smelt • Updated modeling results for the added modeled scenarios accounting for the decision-tree process
Appendix 5J	Effects on Natural Communities, Wildlife, Plants		• Replaced habitat loss tables for covered activities by species and natural communities
Appendix 8A	Implementation Costs Supporting Materials		• Added section for EIR/EIS mitigation costs not counted elsewhere (moved from body of Ch. 8)
Appendix 9A	Economic Benefits of the BDCP and Take Alternatives	Table 9.A 2 Table 9.A 8	• Updated water quality costs and benefits
Appendix 9B	Take Alternative Cost Estimation	Table 9.B 11 Table 9.B 12	• Update costs of the proposed action to reflect the new optimized alignment

Acronyms and Definitions

AMM- Avoidance and Minimization Measure

CM – Conservation Measure

X2 –X2 is the distance in kilometers from the Golden Gate Bridge to the location where tidally averaged bottom salinity is 2 parts per thousand (ppt), also referred to as the mixing zone. It is a measure of western Delta salinity.

HCP- Habitat Conservation Plan

RTM – Reusable tunnel material

SWPP-Stormwater pollution prevention plan

SPCC- Spill prevention, containment and countermeasure plan

BDCP
BAY DELTA CONSERVATION PLAN

Draft Bay Delta Conservation Plan (BDCP) and associated Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS)

Comment Period Extended to June 13, 2014

February 2014

Lead state and federal agencies have extended the public comment period for the Draft BDCP and associated Draft EIR/EIS by 60 days, for a 180-day review. The comment period began on December 13, 2013 and will conclude on June 13, 2014. This extension will allow the public more time to review and comment on the public draft documents.

The Draft BDCP and Draft EIR/EIS are being made available to the public in accordance with the California Natural Community Conservation Planning Act (NCCPA), Section 10 of the federal Endangered Species Act (ESA), the California Environmental Quality Act (CEQA,) and the National Environmental Policy Act (NEPA).

Written comments may be submitted via:

Mail or hand delivery to

Ryan Wulff
National Marine Fisheries Service
650 Capitol Mall, Suite 5–100
Sacramento, CA 95814

Email to

BDCP.comments@noaa.gov

Comments must be received electronically or postmarked on or before June 13, 2014.

No final decisions have been made regarding going forward with the BDCP or in selecting an alternative; those decisions will only occur after completion of the CEQA and NEPA processes.

Copies of the Draft BDCP and Draft EIR/EIS:

Hard copy Draft documents are available at the Department of Water Resources, 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691 and at the National Marine Fisheries Service, 650 Capitol Mall, Suite 5-100, Sacramento, CA 95814, electronically on the project website at www.BayDeltaConservationPlan.com and electronically at libraries throughout the state. Visit www.BayDeltaConservationPlan.com to find a location near you. Copies of the documents referenced in the Draft EIR/EIS will be available at the DWR Office at 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691. If you would like to request a DVD copy of the documents please email a request to BDCP.comments@noaa.gov.

BDCP
BAY DELTA CONSERVATION PLAN

May 2014

BDCP Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) Fast Facts

The BDCP Draft EIR/EIS is...

An analysis of BDCP and its alternatives' negative and beneficial impacts on the human environment, and actions to avoid or minimize negative impacts, with the goal of improving the Delta ecosystem and ensuring reliable water supplies for 25 million Californians.

Environmental Analysis Objectives

DEVELOP REASONABLE ALTERNATIVES to meet the purpose and need and avoid or minimize impacts

ANALYZE Environmental impacts

DEVELOP MITIGATION MEASURES to reduce or avoid impacts

EVALUATE Economic impacts

PREPARE INFORMATION for public and stakeholder review and comment

DISCLOSE project impacts, mitigation, and public comments to decision-makers

Robust, Science Driven Screening Process

Alternatives evaluated in the Draft EIR/EIS must:

1. Be feasible and reasonable
2. Meet project objectives
3. Avoid or substantially reduce significant impacts

FIRST SCREENING LEVEL
Identify Alternatives

SECOND SCREENING LEVEL
Avoid or lessen environmental impacts and address significant issues

THIRD SCREENING LEVEL
Define potentially feasible and reasonable alternatives

SCREENING FOR CONSISTENCY
with the 2009 Delta Reform Act, scoping comments, and existing water rights of non-BDCP participants

Identification of
15 ACTION ALTERNATIVES
and
1 NO-ACTION ALTERNATIVE/ EXISTING CONDITIONS

The BDCP Draft EIR/EIS Analyzes more than 600 resource area impact categories. Of these resource impact categories,

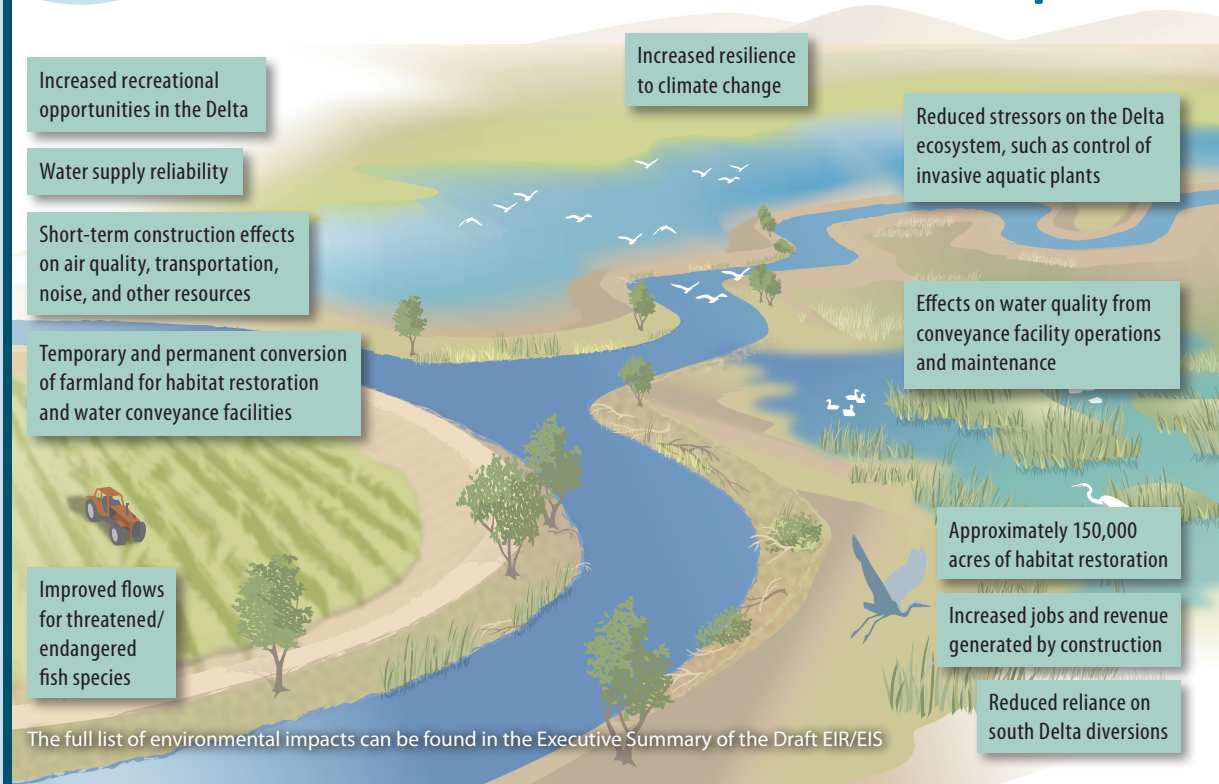
65-79 environmental impacts were deemed beneficial, depending upon the alternative evaluated.

57-60 resource areas were found to have no impact,

and up to 431 resource area impacts were deemed less than significant.

The Draft EIR/EIS determined 54-72 significant and unavoidable impacts (as determined by the California Environmental Quality Act), depending upon alternative, that may be reduced with the implementation of additional mitigation measures.

BDCP Environmental Benefits and Impacts



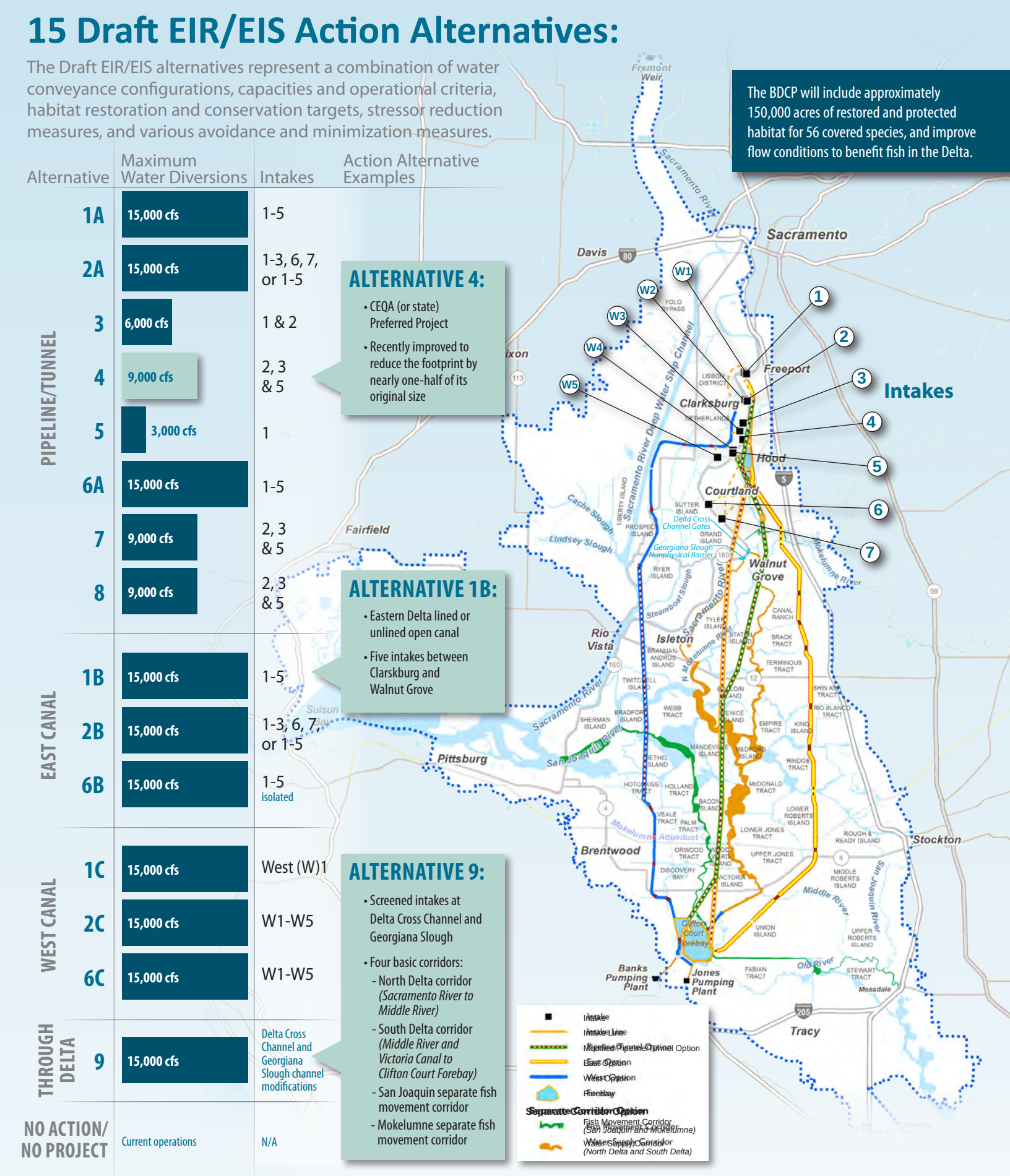
The full list of environmental impacts can be found in the Executive Summary of the Draft EIR/EIS

15 Draft EIR/EIS Action Alternatives:

The Draft EIR/EIS alternatives represent a combination of water conveyance configurations, capacities and operational criteria, habitat restoration and conservation targets, stressor reduction measures, and various avoidance and minimization measures.

The BDCP will include approximately 150,000 acres of restored and protected habitat for 56 covered species, and improve flow conditions to benefit fish in the Delta.

	Alternative	Maximum Water Diversions	Intakes	Action Alternative Examples
PIPELINE/TUNNEL	1A	15,000 cfs	1-5	
	2A	15,000 cfs	1-3, 6, 7, or 1-5	
	3	6,000 cfs	1 & 2	
	4	9,000 cfs	2, 3 & 5	**ALTERNATIVE 4:** • CEQA (or state) Preferred Project • Recently improved to reduce the footprint by nearly one-half of its original size
	5	3,000 cfs	1	
	6A	15,000 cfs	1-5	
	7	9,000 cfs	2, 3 & 5	
	8	9,000 cfs	2, 3 & 5	
EAST CANAL	1B	15,000 cfs	1-5	**ALTERNATIVE 1B:** • Eastern Delta lined or unlined open canal • Five intakes between Clarskburg and Walnut Grove
	2B	15,000 cfs	1-3, 6, 7, or 1-5	
	6B	15,000 cfs	1-5 isolated	
WEST CANAL	1C	15,000 cfs	West (W)1	**ALTERNATIVE 9:** • Screened intakes at Delta Cross Channel and Georgiana Slough • Four basic corridors: - North Delta corridor *(Sacramento River to Middle River)* - South Delta corridor *(Middle River and Victoria Canal to Clifton Court Forebay)* - San Joaquin separate fish movement corridor - Mokelumne separate fish movement corridor
	2C	15,000 cfs	W1-W5	
	6C	15,000 cfs	W1-W5	
THROUGH DELTA	9	15,000 cfs	Delta Cross Channel and Georgiana Slough channel modifications	
NO ACTION/ NO PROJECT		Current operations	N/A	



NOTE: A full description of the 15 Action Alternatives, and the No Action Alternative, can be found in Chapter 3 (Alternatives) of the Draft EIR/EIS.

For more information, or to submit comments, visit ***www.BayDeltaConservationPlan.com,*** *call* ***1-866-924-9955,*** *or email BDCP.Comments@NOAA.gov.*

For Immediate Release:
Dec. 9, 2013

Media Contact:
Nancy Vogel, (916) 651-7512
Nancy.Vogel@water.ca.gov

State Releases Updated Comprehensive Water Reliability and Ecosystem Restoration Plan

Public Invited to Comment on Bay Delta Conservation Plan to Safeguard Supplies for 25 Million Californians

SACRAMENTO, Calif. – The state of California and its federal partners have announced the release of the Bay Delta Conservation Plan for formal public review. This is a significant milestone in the effort to restore ecosystem health and secure reliable water supplies for California. The release is a key step toward completion of a final plan and corresponding environmental documents.

The plan seeks to protect delivery of the mountain snowmelt that supplies water to two-thirds of the state's population from San Jose to San Diego and thousands of Central Valley farms. It focuses on the estuary where the snowmelt flows, the Sacramento-San Joaquin Delta, and aims to both reverse the ecological decline of the region and modernize a water system that now depends on hundreds of miles of earthen levees vulnerable to earthquake, flood, and rising sea levels.

Release of the public review draft of the Bay Delta Conservation Plan and its corresponding Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) triggers a 120-day period for the gathering of public comments, from Dec. 13, 2013 through April 14, 2014. Citizens, organizations, and government agencies are urged to review and comment on the documents. From mid-January through mid-February, experts will be available at a dozen separate public meetings to facilitate review of the plan, and to hear public comments on the plan and accompanying environmental documents.

All substantive comments received during the public review period will be considered and discussed in a final EIR/EIS. Completion of the final documents would allow project proponents to begin seeking the many permits necessary to implement the comprehensive plan.

The Bay Delta Conservation Plan aims to both stabilize water deliveries from the Delta and contribute to the recovery of 56 species of plants, fish and wildlife over the 50-year life of the plan. The Legislature delineated those co-equal goals in the 2009 Delta Reform Act.

The 9,000-page Bay Delta Conservation Plan and its corresponding 25,000-page EIR/EIS reflect significant revisions since the informal release of administrative review drafts last spring and summer. The public review draft documents reflect changes such as:

- Changes to the alignment of the proposed water conveyance tunnels that would significantly reduce disruption to north Delta communities and reduce by half the project’s permanent footprint.

- More detail about the plan's critical adaptive management process, which would use research, monitoring, and adjustment of actions to ensure that environmental measures truly contribute to the recovery of covered species.
- Refinement and revision of how the plan would be governed.
- A description of the tools and sources of funding potentially available to support the adaptive management process if additional Delta flows and water supply are needed.
- Additional design criteria and operational constraints for the proposed north Delta intakes, including fish studies that would influence facility design.
- Addition of further measures to protect the greater sandhill crane, giant garter snake, and saltmarsh harvest mouse.

"This is a rational, balanced plan to help meet the needs of all Californians for generations to come," said California Natural Resources Secretary John Laird. "By meeting the state's dual goals for BDCP of ecosystem restoration and water supply reliability, we will stabilize and secure against catastrophe the water deliveries that sustain our homes, jobs, and farms, and do so in a way that not only protects but enhances the environment."

The plan proposes to change the way the State Water Project (SWP) and Central Valley Project (CVP) divert water from the Delta. It proposes the construction of new intakes in the north Delta along the Sacramento River about 35 miles north of the existing pumping plants. Twin tunnels would carry the water underground to the existing pumping plants, which feed canals that stretch hundreds of miles to the south and west.

A northern diversion on the Sacramento River would minimize environmentally harmful reverse flows in the south Delta that are caused when the existing pumping plants draw water from nearby channels.

The Bay Delta Conservation Plan has been developed through seven years of analysis and hundreds of public meetings. It is a habitat conservation plan under the federal Endangered Species Act and a natural community conservation plan under California law. It describes 22 separate conservation measures that would be undertaken by the California Department of Water Resources, operator of the SWP, in coordination with the U.S. Bureau of Reclamation, operator of the CVP. The plan would provide a stable regulatory environment for operation of the SWP, while working toward the recovery of imperiled fish species.

Water users served by the SWP and CVP – primarily in Southern California, the Santa Clara Valley, and the San Joaquin Valley – would pay most costs under the plan, including the entire $16 billion cost associated with new intakes and tunnels.

To read the public review draft Bay Delta Conservation Plan, get guidance on how to comment on the plan, and see the schedule of public meetings, please visit http://baydeltaconservationplan.com.

For BDCP updates online, follow us on Twitter @BDCP_CA and on Facebook.
For assistance on locating specific information within the BDCP documents, use Twitter hashtag #WhereinBDCP.

# # #

BDCP
BAY DELTA CONSERVATION PLAN

May 2014

Fast Facts

The BDCP is...

...a long-term strategy to secure California's water supplies and improve the ecosystem of the Sacramento-San Joaquin River Delta.

The BDCP Co-Equal Goals

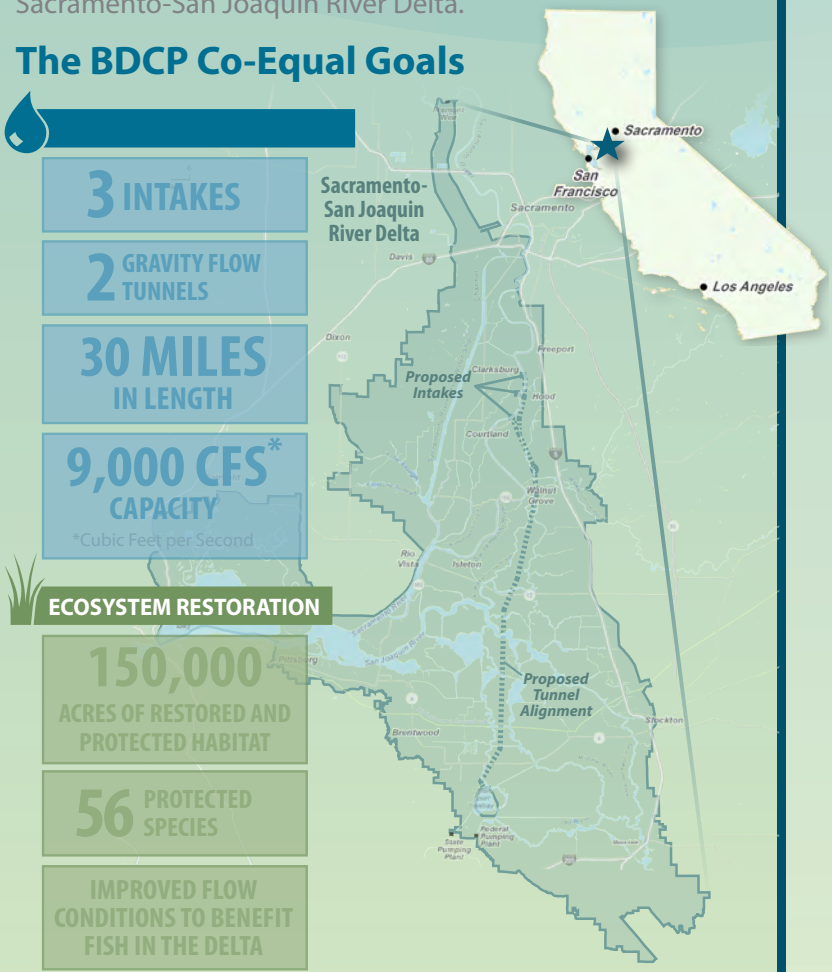
3 INTAKES

2 GRAVITY FLOW TUNNELS

30 MILES IN LENGTH

9,000 CFS* CAPACITY

*Cubic Feet per Second



ECOSYSTEM RESTORATION

150,000 ACRES OF RESTORED AND PROTECTED HABITAT

56 PROTECTED SPECIES

IMPROVED FLOW CONDITIONS TO BENEFIT FISH IN THE DELTA

The BDCP Would Benefit Millions of Californians

The BDCP is one part of California's overall water portfolio. It aims to protect our unique Delta ecosystem and secure water supplies for a vast part of the California economy.

SECURING WATER SUPPLIES

4.7-5.6
MILLION ACRE-FEET ON AVERAGE ANNUALLY
(An acre-foot is roughly as much water as two California households use, indoors and outdoors, in a year)

CREATING & PROTECTING JOBS

1.1 MILLION
FULL-TIME EQUIVALENT JOBS CREATED AND SAVED FOR CALIFORNIA
(Based on a year by year estimate)

BOOSTING THE ECONOMY

$84 BILLION
INCREASE IN STATE ECONOMIC PRODUCTIVITY

The BDCP is Important for California

WATER SUPPLY RELIABILITY

25 MILLION PEOPLE

from the Bay Area to San Diego rely on water from the Delta

MORE THAN 3 MILLION ACRES OF FARMLAND
rely on water from the Delta

DELTA FISH AND WILDLIFE
depend upon a healthy Delta ecosystem

CLIMATE RISK ADAPTATION

LEVEE FAILURES

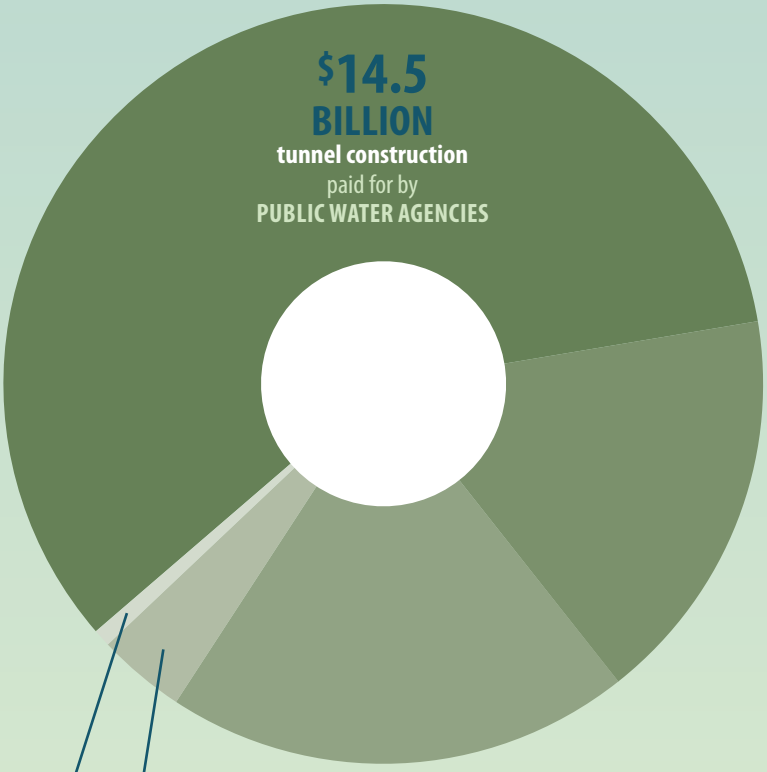
RISING SEA LEVELS

EARTHQUAKES

NATURAL RISKS AND CLIMATE CHANGE
threaten the reliability of the existing system

BDCP Cost and Funding...

...implemented over a 50-year period.



$.927 BILLION to address other stressors — paid for by **PUBLIC WATER AGENCIES AND STATE/FEDERAL FUNDING**

$.184 BILLION for monitoring, research, plan administration, and other costs — paid for by **PUBLIC WATER AGENCIES AND STATE/FEDERAL FUNDING**

[1] *The availability of federal funds will be contingent on future federal appropriations.*

The BDCP is Guided by the Best Available Science

ADAPTIVE MANAGEMENT PROGRAM

to implement and monitor BDCP biological goals and objectives

WATER OPERATIONS

by the Department of Water Resources and the U.S. Bureau of Reclamation

OVERSIGHT

by state and federal fish and wildlife agencies

The BDCP Would Benefit the Delta Ecosystem

DELTA RESTORATION

BDCP would contribute to the conservation of 56 species of fish, plants and wildlife in the Delta.

45

SPECIES OF PLANTS & WILDLIFE CONSERVED

through protection and enhancements in the quantity and quality of habitat in the Delta.

52%

INCREASE IN PROTECTED LAND

in the Delta

11

FISH SPECIES BENEFIT,

from an increase in the amount and quality of habitat, food sources, and ecological function of Delta flows. Species include Chinook salmon and delta smelt.

10

OTHER STRESSOR REDUCTION MEASURES

would reduce adverse effects, such as invasive species, predation, and contaminants, to improve the ecological function of the Delta.

For more information, or to submit comments, visit ***www.BayDeltaConservationPlan.com****, call* ***1-866-924-9955,*** *or email info@BayDeltaConservationPlan.com.*

Chapter 20: Public Services and Utilities		
20.3.3.9	Alternative 4 – Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5	• Revised impact conclusion and discussion regarding fire station in Hood in response to optimized alignment (no longer identified as a "significant and unavoidable" impact associated with Alternative 4)

Chapter 22: Air Quality and Greenhouse Gases		
22.3.3.9	Alternative 4 – Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5	• Revised impact conclusions and discussion regarding health risks in the Bay Area Air Quality Management District in response to optimized alignment (now identified as a "significant and unavoidable" impact associated with Alternative 4) • Revised impact conclusions and discussion regarding criteria pollutants in the Sacramento Metropolitan Air Quality Management District in response to optimized alignment (no longer identified as a "significant and unavoidable" impact associated with Alternative 4)
Chapter 30: Growth Inducement and Other Indirect Effects		
30.3.6	Environmental Impacts Relating to Water Transfers	• Section added to provide discussion of potential effects from water transfers (moved from individual resource chapters in favor of a consolidated discussion in this chapter)
Chapter 31: Other CEQA/NEPA Required Sections		
31.5.2	Mitigation Measures	• Discussion regarding mitigation measures with potential for significant environmental effects under CEQA or adverse effects under NEPA included.
31.4 (Table 31-1)	Summary of Significant and Unavoidable Adverse Impacts	• Addition of a table summarizing significant and unavoidable impacts under Alternative 4
Appendices		
Appendix 1E	Water Transfers in California: Types, Recent History, and General Regulatory Setting	• Appendix added by DWR to provide background information regarding water transfers
Appendix 3A	Identification of Water Conveyance Alternatives, Conservation Measure 1	• Additional discussion of recent proposals (i.e. "portfolio" approach) in alternatives screening appendix
Appendix 3B	Environmental Commitments	• Revised and added environmental and "other" commitments in response to agency comments (e.g. commitment to reuse RTM, inclusion of DOC in other commitments related to water quality)

Section	Section Title	Summary of Change
Appendix 5A	BDCP EIR/EIS Modeling Technical Appendix	• Section D added at the request of federal lead agencies to provide additional background information related to modeling
Appendix 5C	Historical Background of Cross-Delta Water Transfers and Potential Source Regions	• Appendix added by DWR to provide discussion of water transfers across the Delta
Appendix 5D	Water Transfer Analysis Methodology and Results	• Appendix added by DWR to assess the potential for additional water transfers associated with implementation of BDCP
Appendix 11D		• Appendix prepared that includes mean temperatures by month and water year type for all locations evaluated in the analysis
Appendix 31A	BDCP Later CM Activity Environmental Checklist	• Appendix added to discuss which actions under CMs 2-22 could require future CEQA/NEPA. Prepared in response to input from DWR counsel.

Acronyms and Definitions

AMM – Avoidance and Minimization Measures

CEQA – California Environmental Quality Act

CM- Conservation Measure

DOC- Dissolved organic carbon

DWR- California Department of Water Resources

ES- Executive Summary

HCP – Habitat Conservation Plan

NEPA – National Environmental Policy Act

NMFS- National Marine Fisheries Service

RTM- Reusable tunnel material

USFWS- U.S. Fish and Wildlife Service

BDCP
Bay Delta Conservation Plan

WELCOME

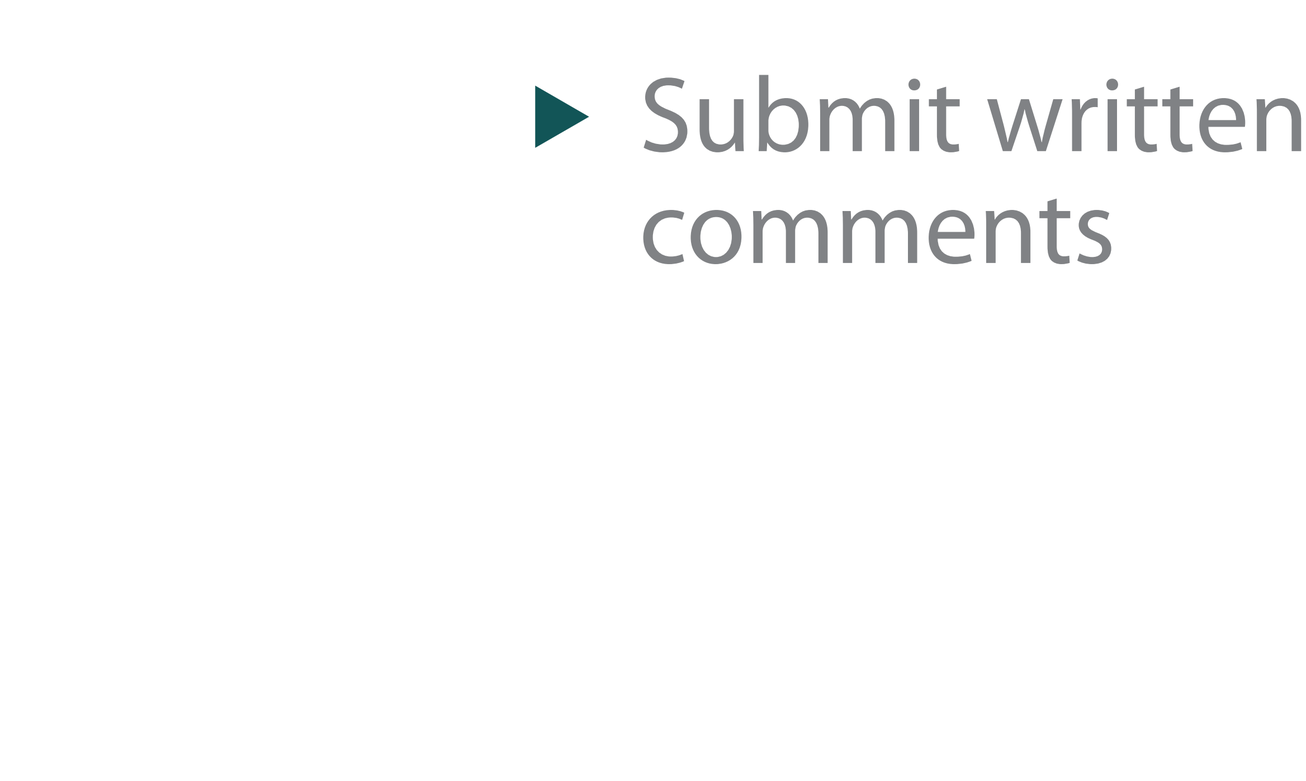
Draft Bay Delta Conservation Plan and
Associated Draft EIR/EIS

Open House Meeting

BDCP
Bay Delta Conservation Plan

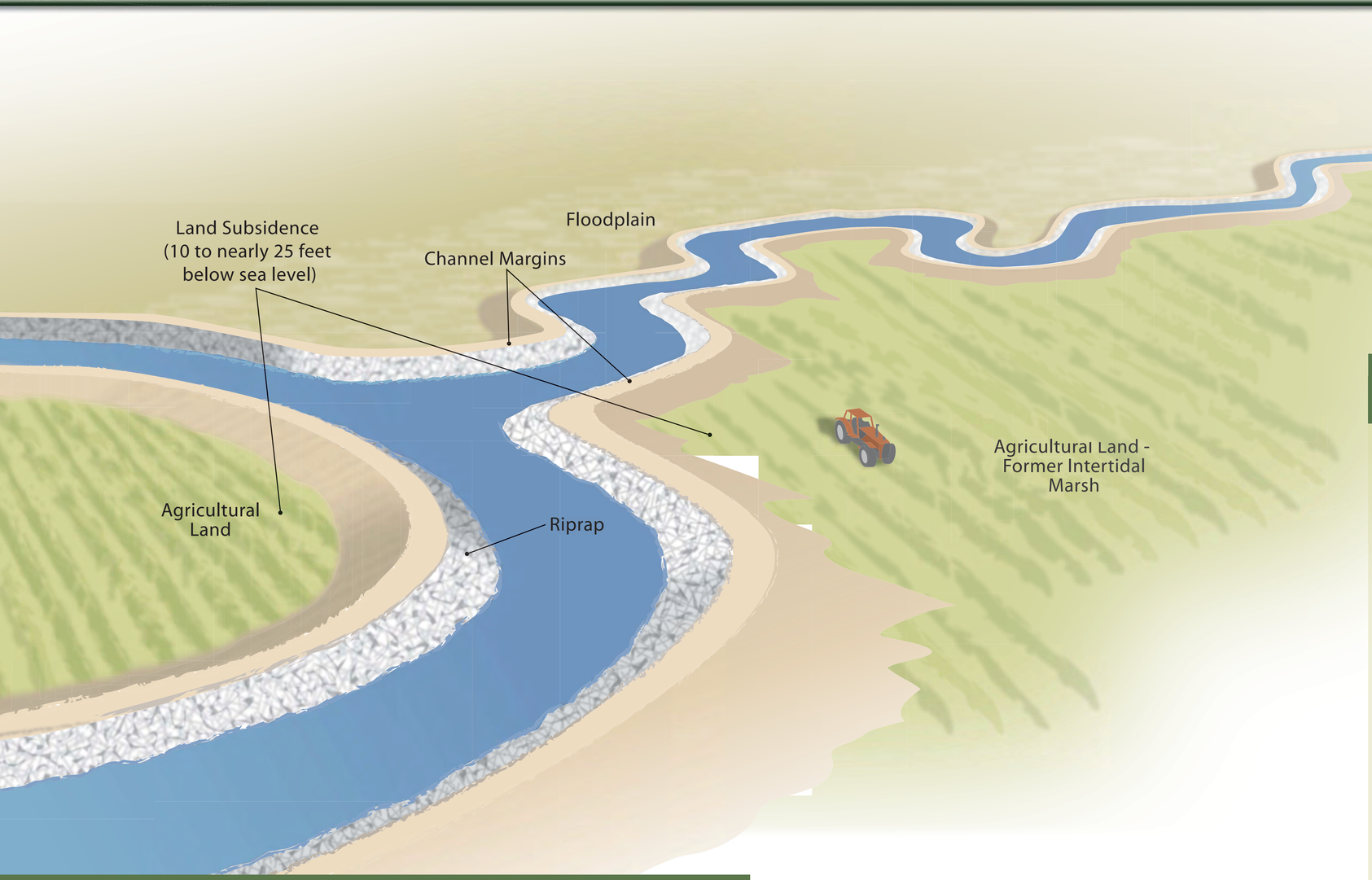
BDCP Public Meeting Format

- Open house format
- No presentations
- No testimony given to panel
- Ask us your questions
- Locate information in the documents
- Submit written or verbal comments



BDCP
Bay Delta Conservation Plan

The Problem



The heart of California's water system rests in the Delta, and its current configuration puts it—and the broader economy—at serious risk. The status quo of the Delta—both the ecosystem and the water system depending on it—is not sustainable.

The Current State of the Delta

- Highly altered environment, manmade levees, reservoirs, other water infrastructure
  - Lack of habitat
  - Altered flow and entrainment
  - Contaminants, nutrients invasive species, and predation
- Declining populations of fish species
- Increasingly unreliable water deliveries
- Increasing threats of continuing land subsidence, seismic events and climate change

BDCP
Bay Delta Conservation Plan

The Proposed BDCP Would Benefit

Millions of Californians

The BDCP is one part of California's overall water portfolio. It aims to protect our unique Delta ecosystem and secure water supplies for a vast part of the California economy by:

SECURING WATER SUPPLIES

4.7-5.6
MILLION ACRE-FEET ON AVERAGE ANNUALLY
(An acre-foot is roughly as much water as two California households use, indoors and outdoors, in a year)

CREATING & PROTECTING JOBS

1.1 MILLION
FULL-TIME EQUIVALENT JOBS CREATED AND SAVED FOR CALIFORNIA
(Based on a year by year estimate)

BOOSTING THE ECONOMY

$84 BILLION
INCREASE IN STATE ECONOMIC PRODUCTIVITY

The Delta Ecosystem

DELTA RESTORATION

BDCP would contribute to the conservation of 56 species of fish, plants and wildlife in the Delta.

45
SPECIES OF PLANTS & WILDLIFE CONSERVED through protection, restoration, creation, and enhancement of the quantity and quality of habitat in the Delta.

11
FISH SPECIES BENEFIT, from an increase in the quantity and quality of habitat, food sources, and ecological function of Delta flows. Species include Chinook salmon and delta smelt.

52%
INCREASE IN PROTECTED LAND in the Delta for habitat.

10
OTHER STRESSOR REDUCTION MEASURES would reduce adverse effects, such as invasive species, predation, and contaminants, to improve the ecological function of the Delta.

BDCP
Bay Delta Conservation Plan

The Proposed BDCP is

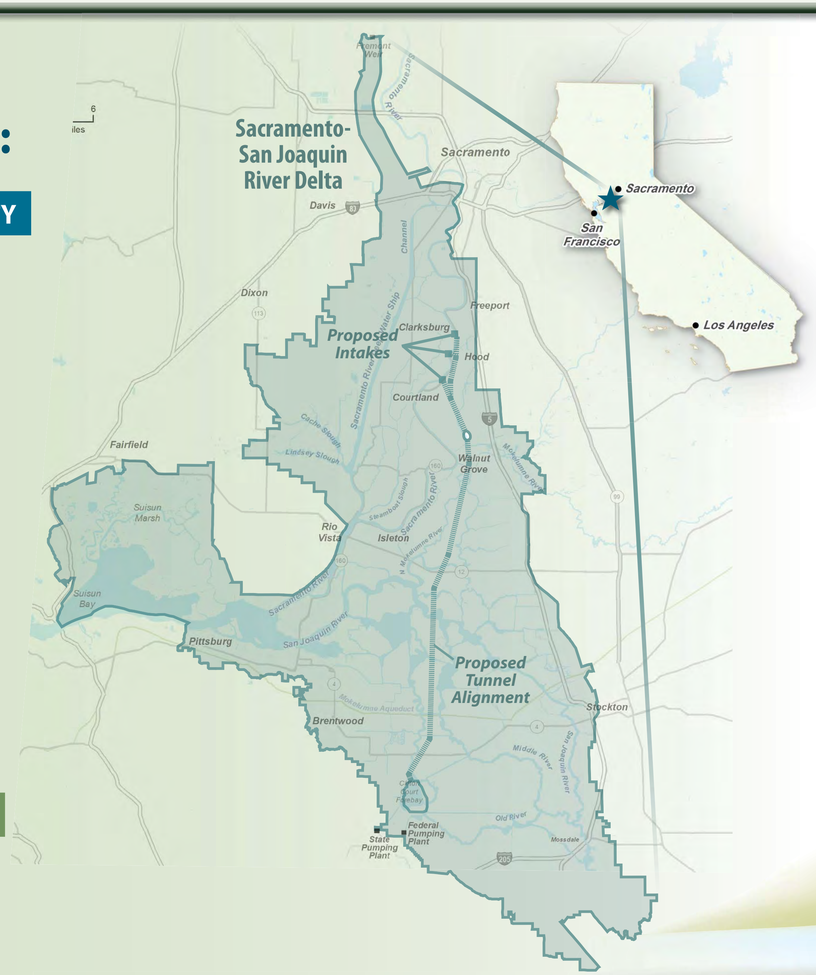
The proposed project includes:

WATER SUPPLY RELIABILITY

- **3 INTAKES**
- **2 GRAVITY FLOW TUNNELS**
- **30 MILES IN LENGTH**
- **9,000 CFS* CAPACITY**
  *Cubic Feet per Second

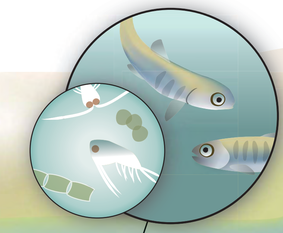
ECOSYSTEM RESTORATION

- **150,000 ACRES OF RESTORED AND PROTECTED HABITAT**
- **56 PROTECTED SPECIES**
- **IMPROVED FLOW CONDITIONS TO BENEFIT FISH IN THE DELTA**



- A part of California's water management portfolio
- A long term strategy to improve the reliability of California's water supplies and improve the ecosystem of the Sacramento-San Joaquin Delta
- A Habitat Conservation Plan

The BDCP provides a way to improve water supply reliability and ecosystem health.



Food supplies and spawning and rearing habitat for many fish species

Floodplain

Channel Margins

Terrestrial species habitat and food supplies for migratory waterfowl

Intertidal Marsh

Agricultural Land

BDCP
Bay Delta Conservation Plan

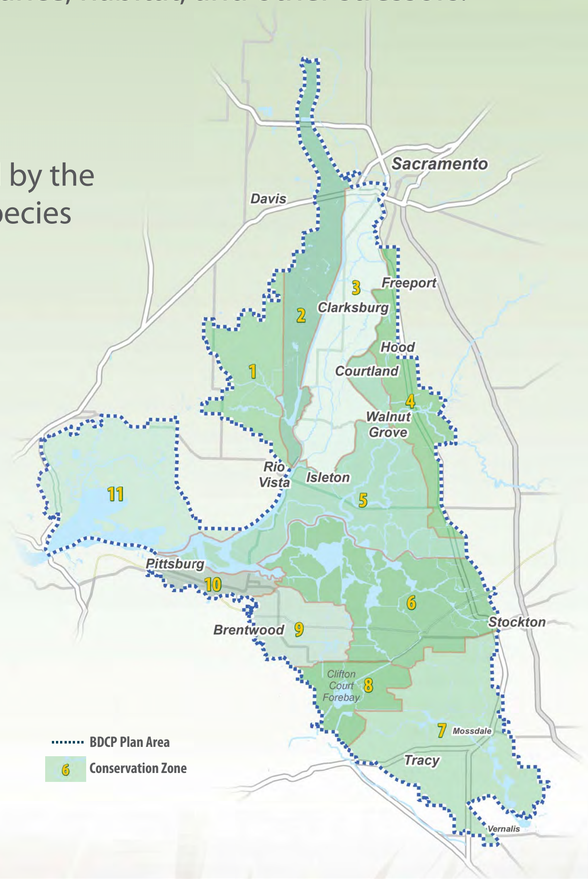
Conservation Strategy

The BDCP includes 22 conservation measures. While they are organized in the BDCP by landscape level, natural community level, and species level, they are shown here by type: water flow/conveyance, habitat, and other stressors.

Conservation Zones

Conservations zones are geographic areas defined by the biological needs of the species covered under the BDCP.

This map shows each conservation zone. The general location of each conservation measure may be determined by looking in the "Conservation Zone" column in the chart at right, which lists the zone(s) associated with each conservation measure.



What is a Conservation Measure?

A conservation measure is a prescribed action designed to achieve the biological goals and objectives of the BDCP and to satisfy state and federal regulatory requirements.

What is a Covered Activity?

Covered activities are those that support water supply, such as water conveyance and facilities maintenance and improvements, as well as any restoration efforts that affect threatened and endangered species. Covered activities include the conservation measures.

Conservation Measures

Measure	Title	Conservation Zone (CZ)	Level	Notes*
WATER FLOW				
CM1	Water Facilities and Operation	Plan Area-wide	Landscape	Construct and operate a dual-conveyance water delivery system.
HABITAT				
CM2	Yolo Bypass Fisheries Enhancement	CZ 2	Landscape	Seasonal modifications of the Yolo Bypass to improve the timing, frequency, and duration of inundation to improve fish habitat
CM3	Natural Communities Protection and Restoration	CZs 1-11	Landscape	Protection of a variety of natural communities with specific requirements by 5-year increments
CM4	Tidal Natural Communities Restoration	CZs 1, 2, 4-7, 11	Natural Community	Restore 65,000 acres
CM5	Seasonally Inundated Floodplain Restoration	Plan Area-wide	Natural Community	Restore 10,000 acres
CM6	Channel Margin Enhancement	CZs 1, 2, 4-6, and/or 7	Natural Community	Restore 20 linear miles
CM7	Riparian Natural Community Restoration	CZs 4 and 7	Natural Community	Restore 5,000 acres, primarily in association with CMs 4, 5, and 6
CM8	Grassland Natural Community Restoration	CZs 1, 8, and/or 11, and other zones as needed	Natural Community	Restore 2,000 acres
CM9	Vernal Pool and Alkali Seasonal Wetland Complex Restoration	CZs 1, 8, or 11	Natural Community	Restore vernal pool complex and alkali seasonal wetland complex to achieve no net loss
CM10	Nontidal Marsh Restoration	CZs 2 , 3, 4, 5, and/or 6	Natural Community	Restore 1,200 acres and create 500 acres of managed wetlands consisting of greater sandhill crane roosting habitat
CM11	Natural Communities Enhancement and Management	Plan Area-wide	Natural Community	Applies to all BDCP-protected and -restored habitats
OTHER STRESSORS				
CM12	MethylMercury Management	CZs 1, 2, 4-7, 11	Species	Minimize the risk for methylation of mercury in restored habitats
CM13	Invasive Aquatic Vegetation Control	CZs 1, 2, 4-7, 11	Species	Control nonnative aquatic vegetation
CM14	Stockton Deep Water Ship Channel Dissolved Oxygen Levels	CZ 6	Species	Maintain dissolved oxygen concentrations above levels that impair covered fish species between Turner Cut and Stockton
CM15	Localized Reduction of Predatory Fishes	CZs 1, 2, 4-7, 11	Species	Reduce the abundance of predatory fish in high predator density locations
CM16	Nonphysical Fish Barriers	CZs 5-8	Species	Placement of nonphysical fish barriers at strategic locations throughout the Delta
CM17	Illegal Harvest Reduction	Plan Area-wide	Species	Reduce illegal harvest of Chinook salmon, Central Valley steelhead and sturgeon
CM18	Conservation Hatcheries	Plan Area-wide	Species	Expand and establish conservation hatcheries for Delta smelt and longfin smelt
CM19	Urban Stormwater Treatment	Plan Area-wide	Species	Implement stormwater treatment measures to decrease contaminant discharges to the Delta
CM20	Recreational Users Invasive Species Program	Plan Area-wide	Species	Minimize risk of introducing invasive nonnative species
CM21	Nonproject Diversions	Plan Area-wide	Species	Remediate agricultural and other diversions not associated with SWP or CVP through voluntary program
AVOIDANCE AND MINIMIZATION				
CM22	Avoidance and Minimization Measures	Plan Area-wide	Species	Avoid and minimize effects of BDCP activities on natural communities and provide habitat for covered species

**These acreage targets estimate implementation of habitat conservation measures over the life of the plan.*

BDCP
Bay Delta Conservation Plan

BDCP Proposed Water Conveyance System (CM1)

CM1 Features:

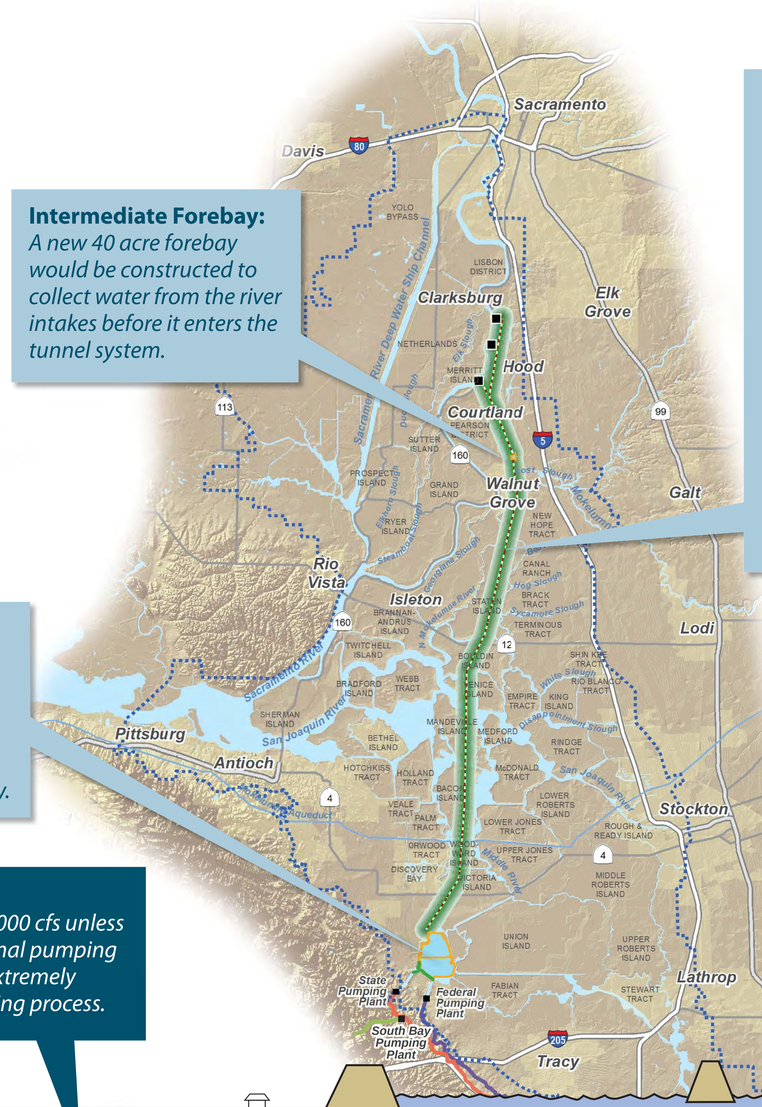
- Three intakes, together capable of diverting up to 9,000 cfs.
- State-of-the-art fish screens that would protect passing fish.
- A forebay for collection of the water diverted from the river.
- Two tunnels to carry water 30 miles to the existing pumping plants in the south Delta. From there, water would be moved into existing aqueducts that supply much of the state.

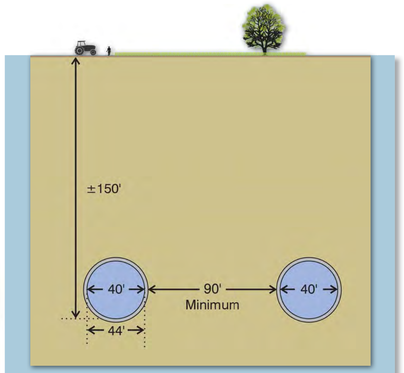
CM1 water facilities and conveyance operations have been refined, largely in response to the potential impact to Delta communities, since first proposed.

Changes include:

- *The number of new Sacramento River intakes has been reduced from five to three and capacity reduced from 15,000 cfs to 9,000 cfs*
- *Underground tunnels, instead of a surface canal, proposed for water transport*
- *Alignment shift away from Delta communities*
- *Shrinking of the intermediate forebay from 750 acres to 40 acres*
- *Height of the pumping plants at the intake facilities reduced from 60 feet to approximately 30 feet."*

Intermediate Forebay: *A new 40 acre forebay would be constructed to collect water from the river intakes before it enters the tunnel system.*





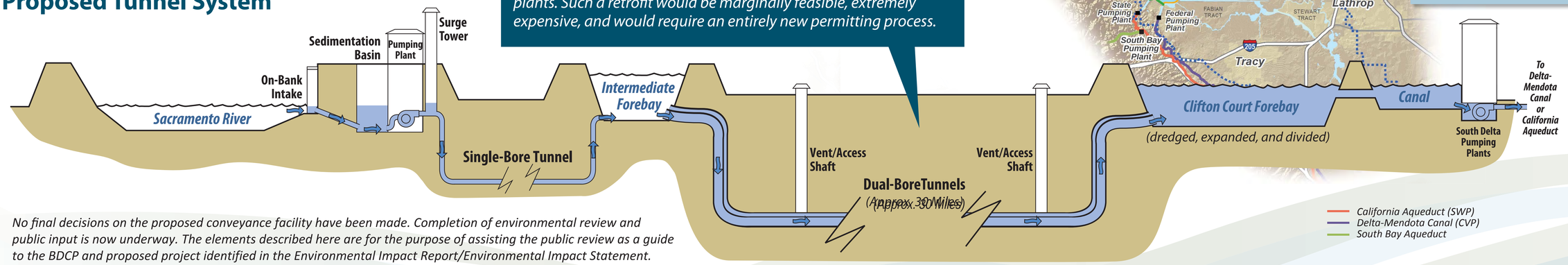
Dual-Bore Tunnels: *Two 40-foot inside-diameter tunnels would be constructed, side by side, more than 150 feet below ground to deliver water supplies to the redesigned Clifton Court Forebay.*

Clifton Court Forebay: *Redesigned to improve overall operations, the existing forebay would be dredged, divided, refurbished, and expanded to the south. Proposed north Delta conveyance facilities would supply water to the northern portion of the forebay, while the southern portion will continue to provide flows to the SWP and operate as it does today.*

Clifton Court Forebay: *Redesigned to improve overall operations, the existing forebay would be dredged, divided, refurbished, and expanded to the south. Proposed north Delta conveyance facilities would supply water to the northern portion of the forebay, while the southern portion will continue to provide flows to the SWP and operate as it does today.*

Designed for 9,000 cfs capacity:
As designed, the tunnels could not carry more than 9,000 cfs unless reinforced with steel liners and pressurized by additional pumping plants. Such a retrofit would be marginally feasible, extremely expensive, and would require an entirely new permitting process.

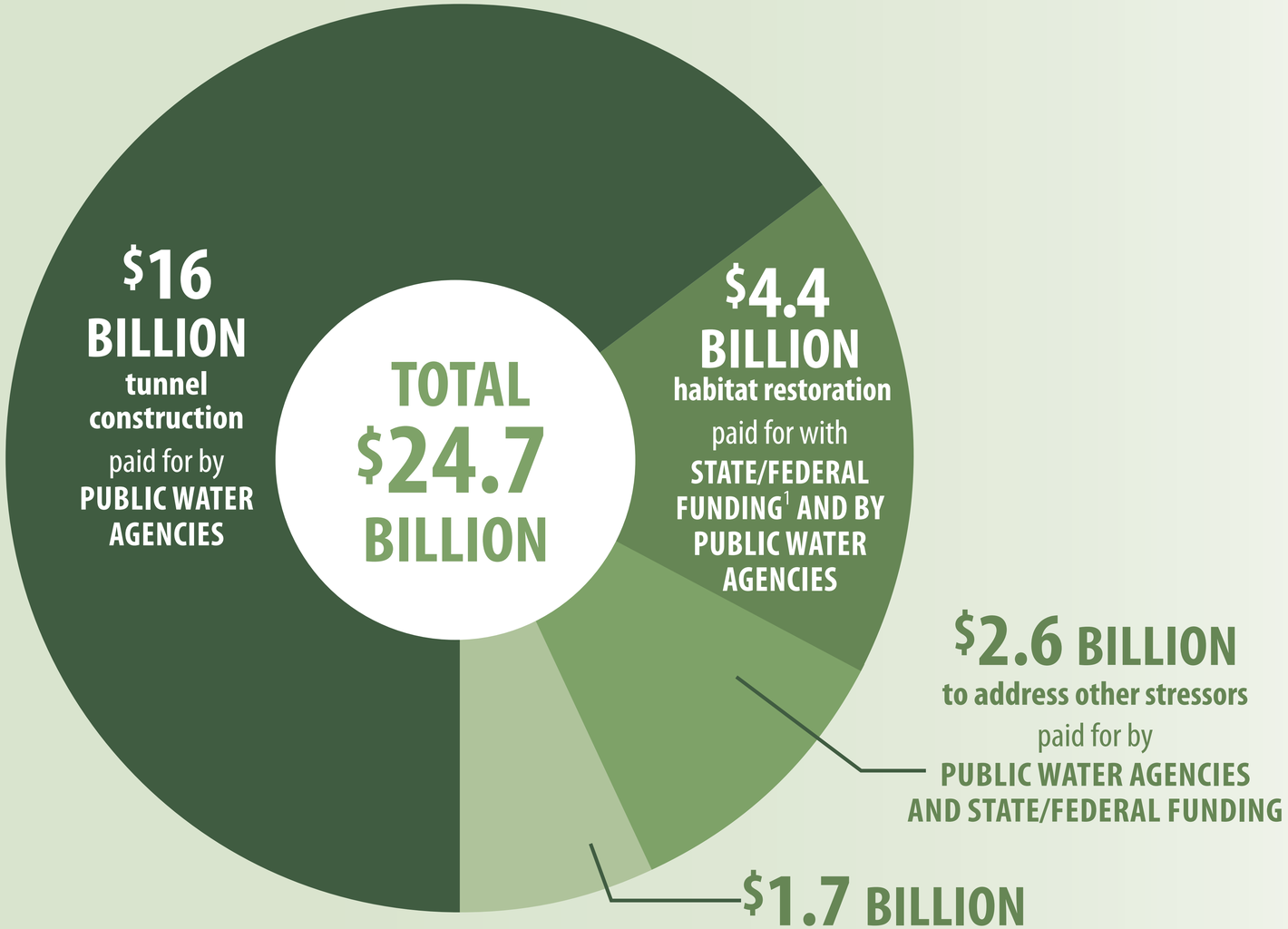
Proposed Tunnel System



No final decisions on the proposed conveyance facility have been made. Completion of environmental review and public input is now underway. The elements described here are for the purpose of assisting the public review as a guide to the BDCP and proposed project identified in the Environmental Impact Report/Environmental Impact Statement.

BDCP
Bay Delta Conservation Plan

BDCP Cost and Funding



Estimated COSTS
Capital **$19.85 BILLION**
Operations & Maintenance **$4.9 BILLION**
$24.75 BILLION

Estimated FUNDING
$24.75 BILLION

[1]The availability of federal funds will be contingent on future federal appropriations.

[2]Program oversight includes monitoring and research, adaptive management, management/administration, changed circumstances, and property tax revenue replacement.

BDCP
Bay Delta Conservation Plan

BDCP Governance

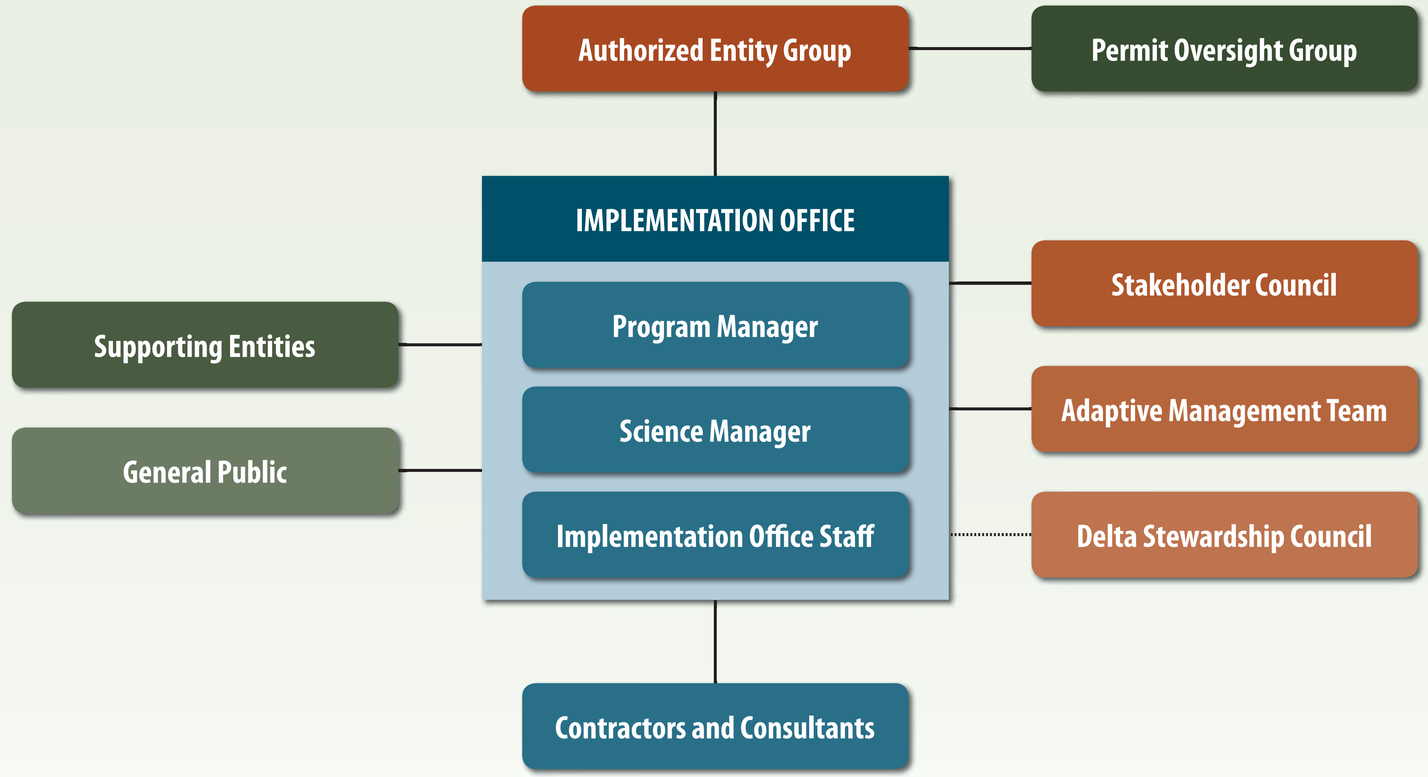
The proposed governance and implementation structure of the BDCP is envisioned as a collaborative effort with defined roles and responsibilities, and a clear process for addressing issues and conflicts as they arise.

The implementation structure is designed to ensure that:

- Sufficient institutional expertise, capacity, resources, and focus are brought to bear to accomplish the BDCP goals and objectives
- The entities receiving regulatory authorizations are accountable to those agencies granting the regulatory authorizations
- The decision-making process regarding BDCP implementation is transparent and understandable to the public

The implementation structure includes:

- Implementation Office
- Authorized Entity Group
- Permit Oversight Group
- Adaptive Management Team
- Stakeholder Council



BDCP
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BDCP Expected Outcomes (Effects Analysis)

Chapter 5, Effects Analysis, of the public Draft BDCP looks at the outcomes that are expected to result in the BDCP implementation.

The Effects Analysis:

- Evaluates the effects of the BDCP actions by comparing an environmental baseline condition to the conditions expected under BDCP
- Compares all conservation measures at various times during BDCP implementation
- Describes the level of take (harm or harassment of species) and the effect of that take from BDCP actions
- Considers climate impacts over the entire 50-year implementation period

Net Effects

The BDCP Effects Analysis evaluates the combined effects of all covered activities, including the conservation measures, to determine the net effect of implementing the Plan for:

- Ecosystems and landscapes
- Natural communities
- Covered plants and wildlife
- Covered fish

To calculate the net benefit of BDCP actions, the EA summarizes the positive and negative effects of the plan to determine the net effect to each covered species.

BENEFICIAL BDCP EFFECTS

+

ADVERSE BDCP EFFECTS

NET BDCP EFFECTS

For details regarding the positive and negative effects for each category, see Chapter 5, Effects Analysis, of the public Draft BDCP.

Scientific Uncertainty

Because the Delta is an ecologically complex estuary, there is a degree of scientific uncertainty. Where a high level of uncertainty is associated with the potential for a conservation measure to achieve plan objectives, that uncertainty will be addressed through research, monitoring, and the adaptive management program.

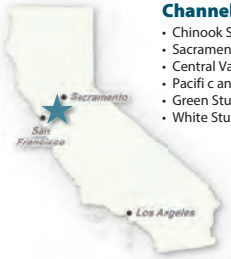
BDCP
Bay Delta Conservation Plan

Anticipated Benefits to Habitat and Species Under Proposed BDCP

Expanding Sandhill Crane Habitat

The greater sandhill crane, one of the oldest living bird species, winters in California's Central Valley with one of the greatest concentrations in the central east Delta. The cranes roost in habitat consisting of wetlands or flooded agricultural fields.

In addition to the restoration identified in CM10, the BDCP includes a comprehensive strategy for contributing to the species' recovery. Construction and operation of conveyance facilities would be designed to avoid and minimize impacts to the crane. To ensure that the important crane population on Staten Island is unharmed by construction, the plan commits to a performance standard of no net loss of crane use days on Staten Island. This standard would be achieved through a number of avoidance and minimization measures.



Channel Margin
- Chinook Salmon
- Sacramento Splittail
- Central Valley Steelhead
- Pacifi c and River Lamprey
- Green Sturgeon
- White Sturgeon

Grassland
- San Joaquin Kit Fox
- Western Burrowing Owl
- California Tiger Salamander
- California Red-legged Frog
- Swainson's Hawk
- Northern Harrier
- White-tailed Kite
- Loggerhead Shrike
- Tricolored Blackbird
- Grasshopper Sparrow

Riparian
- Riparian Brush Rabbit
- Swainson's Hawk
- Valley Longhorn Elderberry Beetle
- Riparian Woodrat
- White-tailed Kite
- Cooper's Hawk
- Osprey
- Western Yellow-billed Cuckoo
- Least Bell's Vireo
- Yellow-breasted Chat
- Great Egret
- Great Blue Heron
- Snowy Egret
- Black-crowned Night Heron
- Western Pond Turtle

Tidal Habitat
- Salt Marsh Harvest Mouse
- California Clapper Rail
- Delta Smelt
- Suisun Shrew
- California Black Rail
- White-Tailed Kite
- Northern Harrier
- Short-eared Owl
- Suisun Song Sparrow
- Tricolored Blackbird
- Yellow-headed Blackbird
- Longfin Smelt
- Chinook Salmon
- Central Valley Steelhead
- Green Sturgeon
- White Sturgeon

New Floodplain
- Central Valley Steelhead
- Chinook Salmon
- Sacramento Splittail
- Western Pond Turtle
- Pacific and River Lamprey
- Green Sturgeon
- White Sturgeon

Cultivated Lands
- Greater Sandhill Crane
- Tricolored Blackbird
- Swainson's Hawk
- White-faced Ibis
- Great Egret
- Great Blue Heron
- Snowy Egret
- Northern Harrier

Managed Wetlands and Other Habitats
- White-tailed Kite
- Vertal Pool Tadpole Shrimp
- Giant Garter Snake
- White-faced Ibis
- Northern Harrier
- Loggerhead Shrike
- Giant Garter Snake
- Vernal Pool Fairy Shrimp
- All the other fairy shrimp

BDCP
Bay Delta Conservation Plan

Purpose of the Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS)

Helps to fulfill the requirements of the:

- California Environmental Quality Act (CEQA)
  - For CEQA compliance:
    Describe the proposed project, identify its significant environmental impacts, and develop reasonable mitigation measures and alternatives to eliminate or reduce such impacts
  - May support future regulatory actions or approvals
- National Environmental Policy Act (NEPA)
  - For NEPA compliance:
    Describe a reasonable range of alternatives that meet project purpose and need, analyze environmental impacts of each alternative, and develop mitigation measures that would avoid or minimize adverse impacts or enhance the environment
  - May support future regulatory actions or approvals

BDCP
Bay Delta Conservation Plan

Draft EIR/EIS Project Objectives and Purpose and Need

Chapter 2 of the Draft EIR/EIS describes the project's objectives, purpose and need as required by CEQA and NEPA.

Project Need

*"**The need for the action** is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural and recreational uses, fish and wildlife habitat, and water supply for large portion of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the conveyance system are needed to respond to increased demands upon and risks to water supply reliability, water quality, and the aquatic ecosystem."*

CEQA Project Objectives

*"**DWR's fundamental purpose** in proposing the BDCP is to make physical and operational improvements to the State Water Project (SWP) system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and Central Valley Project (CVP) south-of-Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations."*

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Bay Delta Conservation Plan

Draft EIR/EIS Project Objectives and Purpose and Need

Chapter 2 of the Draft EIR/EIS describes the project's objectives, purpose and need as required by CEQA and NEPA.

NEPA Purpose

1. Consider the applications for incidental take permits for the covered species that authorize take related to the actions listed below.
    a. The operation of existing SWP Delta facilities.
    b. The construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
    c. The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the ESA, pursuant to the ESA at section 10(a)(1)(B) and its implementing regulations and policies.
2. Improve the ecosystem of the Delta by implementing the actions listed below.
    a. Providing for the conservation and management of covered species through actions within the BDCP Planning Area that will contribute to the recovery of the species.
    b. Protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities and ecosystems.
    c. Reducing the adverse effects on certain listed species due to diverting water.
3. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

Chapter 8 – Water Quality

Chapter 8 – Water Quality

- Describes potential impacts on surface water quality
- The study area includes:
  - The Plan Area
  - Upstream of the Delta region
  - SWP/CVP Export Service Areas

Chapter 8 addresses two key questions:

- Would implementation of the BDCP or its alternatives result in effects on water quality in the study area?
- Would implementation of the BDCP or its alternatives result in changes to water quality that would have impacts to beneficial uses?

See public Draft EIR/EIS Chapter 8 for the impact analysis and conclusions.

You may also be interested in:

- Public Draft EIR/EIS Appendix 8A- Water Quality Criteria and Objectives
- Public Draft EIR/EIS Appendix 8B- Summary of Data Availability Used in Environmental Setting
- Public Draft EIR/EIS Appendix 8C - Screening Analysis
- Public Draft EIR/EIS Appendix 8H- Electrical Conductivity

Chapter 6 – Surface Water

- Examines the effects of implementing BDCP or its alternatives on surface waters in the Delta and upstream of the Delta
- The study area includes:
  - Sacramento hydrologic region
  - The Delta
  - Suisun Marsh

Chapter 6 analysis focuses on the following types of impacts:

- Changes in reverse flow conditions in Old River and Middle River
- Effects on flood management as a result of changes in water storage and flows

See public Draft EIR/EIS Chapter 6 for the impact analysis and conclusions.

Chapter 7 – Groundwater

- Examines the effects of implementing BDCP or its alternatives on groundwater resources
- The study area includes:
  - The Plan Area
  - Upstream of the Delta region
  - SWP and CVP export service areas

Chapter 7 analysis focuses on the following types of impacts:

- Depletion of groundwater supplies or interference with groundwater recharge
- Degradation of groundwater quality
- Interference with agricultural drainage

See public Draft EIR/EIS Chapter 7 for the impact analysis and conclusions.

You may also be interested in:
- Public Draft EIR/EIS Appendix 7A- Groundwater Model Documentation

Chapter 5 – Water Supply

- Describes the effects that implementing the BDCP or its alternatives would have on water supply conditions
- The study area includes:
  - The Plan Area
  - Upstream of the Delta region
  - SWP/CVP export service areas

Chapter 5 analysis focuses on the following types of impacts:

- Change in Delta outflow
- Change in SWP and CVP reservoir storage
- Change in Delta water exports
- Change in SWP and CVP deliveries

See public Draft EIR/EIS Chapter 5 for the impact analysis and conclusions.

You may also be interested in:

- Public Draft EIR/EIS Appendix 5A-Modeling Technical Appendix
- Public Draft EIR/EIS Appendix 5B - Responses to Reduced South of Delta Water Supplies
- Public Draft EIR/EIS Appendix 5D- Water Transfer Analysis Methodology and Results

BDCP
Bay Delta Conservation Plan

Chapter 17 – Visual Resources and Chapter 23 – Noise

Chapter 17 – Aesthetics and Visual

- Examines the effects of implementing BDCP or its alternatives on visual resources.
- Study Area includes:
  - The Plan Area

Chapter 17 analysis focuses on the following types of visual impacts:

- Visual character
- Visual quality
- Viewer response, e.g. exposure, sensitivity, distance and duration of views

See public Draft EIR/EIS Chapter 17 for the impact analysis and conclusions.

You may also be interested in:
- Public Draft EIR/EIS Appendix 17D- Permanent Impacts after Construction is Complete

Chapter 23 – Noise

- Examines the potential impacts of noise and vibration resulting from construction and operation of the water conveyance facilities and restoration actions, specifically as they relate to regional city and county noise ordinances and restrictions for sensitive receptors
- Study Area includes:
  - The Plan Area

Chapter 23 analysis focuses on the following types of noise impacts:

- Annoyance, nuisance or dissatisfaction
- Interference with activities such as speech, sleep or learning
- Physiological effects such as startling and hearing loss

See public Draft EIR/EIS Chapter 23 for the impact analysis and conclusions.

Chapter 11 – Fish and Aquatic Resources

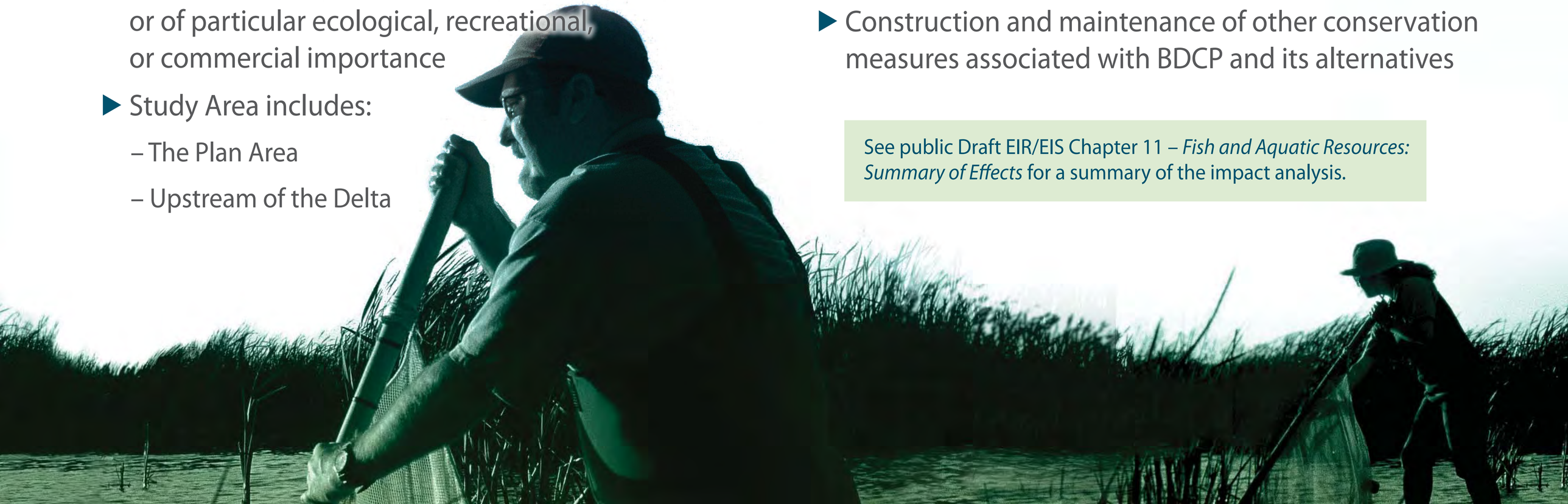
Considers:

- The effects of implementing BDCP or its alternatives on fish and aquatic resources
- 11 covered fish species listed as endangered, threatened, or at risk of being listed as endangered or threatened during BDCP permit term
- 9 non-covered species, either special status species or of particular ecological, recreational, or commercial importance
- Study Area includes:
  - The Plan Area
  - Upstream of the Delta

Chapter 11 analysis considered the following categories of impact mechanisms:

- Construction and maintenance of water conveyance facilities associated with BDCP and its alternatives
- Water operations of water conveyance facilities associated with BDCP and its alternatives
- Construction and implementation of restoration measures associated with BDCP and its alternatives
- Construction and maintenance of other conservation measures associated with BDCP and its alternatives

See public Draft EIR/EIS Chapter 11 – *Fish and Aquatic Resources: Summary of Effects* for a summary of the impact analysis.



Chapter 12 – Terrestrial Biological Resources

Chapter 12 – Terrestrial Biological Resources

Considers:

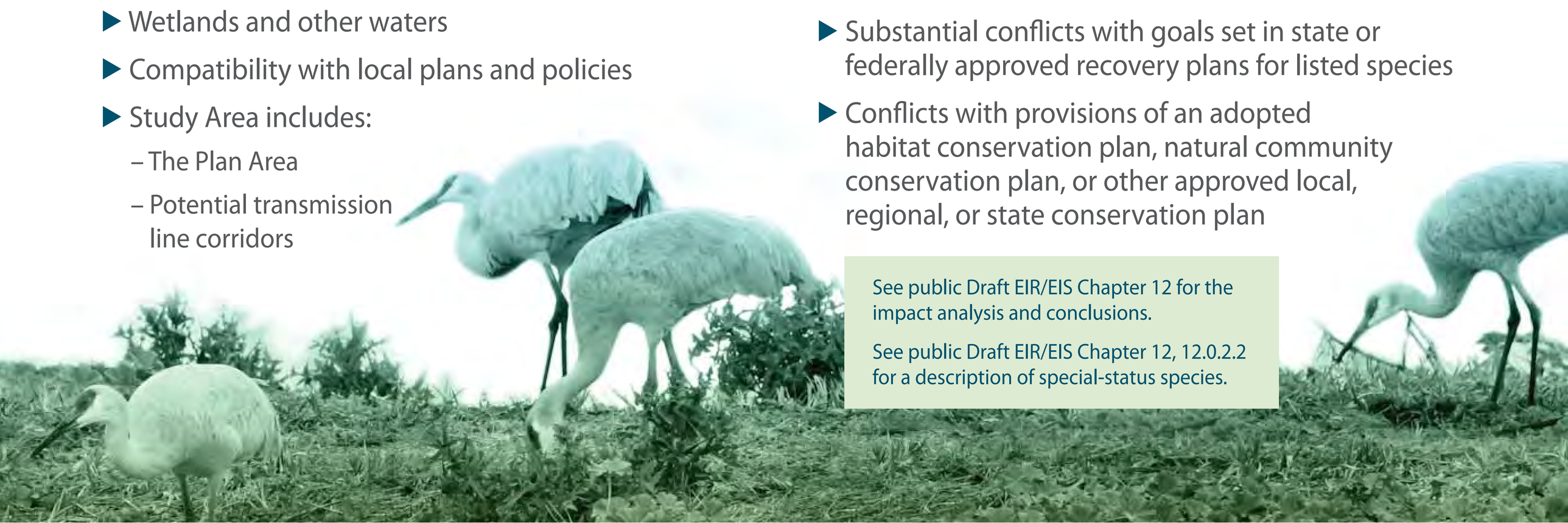
- 14 Natural Communities
- 149 special status wildlife and plant species
- Common wildlife species such as shorebirds and waterfowl
- Habitat corridors
- Wetlands and other waters
- Compatibility with local plans and policies
- Study Area includes:
  - The Plan Area
  - Potential transmission line corridors

Chapter 12 analysis focuses on the following types of impacts:

- Harm or harassment of individuals or populations of special-status species
- Removal or damage to habitat that supports special-status species
- Creation of barriers to the movement of special-status species
- Substantial conflicts with goals set in state or federally approved recovery plans for listed species
- Conflicts with provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state conservation plan

See public Draft EIR/EIS Chapter 12 for the impact analysis and conclusions.

See public Draft EIR/EIS Chapter 12, 12.0.2.2 for a description of special-status species.



Chapter 14 – Agricultural Resources

- Describes the possible effects of implementing BDCP or its alternatives on the Delta's agricultural region, including the temporary effects associated with construction of water conveyance facilities as well as permanent conversion of agricultural lands to nonagricultural uses in the Delta region (Cache Slough, Cosumnes/Mokelumne, Suisun Marsh, West Delta and South Delta Areas).
- Other topics related to agricultural resources are discussed in other chapters:
  - Chapter 5, Water Supply
  - Chapter 6, Surface Water
  - Chapter 7, Groundwater
  - Chapter 8, Water Quality
  - Chapter 9, Geology and Seismicity
  - Chapter 10, Soils
  - Chapter 12, Terrestrial Biological Resources
  - Chapter 16, Socioeconomics
  - Chapter 24, Hazards and Hazardous Materials
  - Chapter 25, Public Health
  - Chapter 28, Environmental Justice
  - Chapter 30, Growth Inducement

Estimated Conversion of Important Farmland to Nonagricultural Uses Associated with CM1

Alternative	Permanent Surface Impacts	Temporary and Short-Term Surface Impacts	Total	Percent of Total Important Farmland in Plan Area
Alternatives 1A and 6A	4,984	1,329	6,313	1.23%
Alternatives 1B and 6B	18,875	2,144	21,019	4.10%
Alternatives 1C and 6C	13,014	3,170	16,184	3.16%
Alternative 2Aa	4,992	1,826	6,818	1.33%
Alternative 2Ba	18,868	2,669	21,537	4.20%
Alternative 2C	13,019	3,170	16,189	3.16%
Alternative 3	4,838	953	5,791	1.13%
Alternative 4	4,975	1,315	6,290	1.23%
Alternative 5	4,770	833	5,603	1.09%
Alternatives 7 and 8	4,883	1,105	5,987	1.17%
Alternative 9	2,459	559	3,018	0.59%

See public Draft EIR/EIS Chapter 14 for the impact analysis and conclusions.

You may also be interested in:

- Public Draft EIR/EIS Appendix 14B - Delta Agricultural Stewardship Strategies

Chapter 15 – Recreation

Chapter 15 – Recreation

- Examines the effects of implementing BDCP or its alternatives on recreational experiences and facilities. Other chapters that discuss tourism and recreation are Chapter 16, *Socioeconomics*, Chapter 17, *Aesthetics and Visual Resources*, Chapter 20, *Public Services and Utilities*, and Chapter 23, *Noise*.

Chapter 15 analysis evaluated:

- Changes in upstream reservoir levels
- Access to Delta recreation sites
- Disruption of existing Delta recreation opportunities such as boating and fishing

See public Draft EIR/EIS Chapter 15 for the impact analysis and conclusions.

Chapter 16 – Socioeconomics

- Describes the socioeconomic conditions in the Delta and the potential effects of BDCP and its alternatives
- Looks at potential effects on:
  - Social and economic characteristics
  - Employment
  - Income at regional levels
  - Population and housing
  - Community character

Chapter 16 analysis considers the following categories of effects:

- Effects of construction, operation, and maintenance of conveyance facilities in the Plan Area and implementation of other conservation measures in the Plan Area
- Effects in hydrologic regions outside the Delta that could result from changes in water deliveries or transfers

See public Draft EIR/EIS Chapter 16 for the impact analysis and conclusions.

You may also be interested in:

- Public Draft EIR/EIS Appendix 16A Regional Economic Impacts of Water Conveyance Facility Construction

Other Resources Studied

The EIR/EIS analysis considers the following categories of effects:

- **Chapter 13** - *Land Use,* describes existing and planned land uses in the Plan Area that could be affected by construction and operation of BDCP or its alternatives
- **Chapter 21** - *Energy,* describes and evaluates the energy production and use associated with the existing SWP and CVP facilities, and the additional energy requirements needed for construction, and operation and maintenance of the BDCP and its alternatives
- **Chapter 24** - *Hazards and Hazardous Materials,* addresses both naturally occurring and human-caused hazards in the Plan Area.
- **Chapter 25** - *Public Health*, addresses potential impacts on human health including but not limited to drinking water quality, pathogens in recreational waters, and disease-carrying mosquitoes.

BDCP
Bay Delta Conservation Plan

Air Quality and Greenhouse Gases, and Climate Change

Chapter 22 – Air Quality and Greenhouse Gases

- Examines the effects of implementing BDCP or its alternatives on air quality, focusing on criteria pollutants and greenhouse gas (GHG) emissions

- The study area includes three air basins: Sacramento Valley, San Joaquin Valley and the San Francisco Bay Area

The analysis focused on the following types of effects:

- Conflict with the applicable air quality plan
- Violation of any air quality standard
- Total direct emissions
- Exposure to sensitive receptors, e.g. schools or day cares
- Creation of objectionable odors

See public Draft EIR/EIS Chapter 22 for the impact analysis and conclusions.

You may also be interested in:
- Public Draft EIR/EIS Appendix 22D - DWR Climate Action Plan

Chapter 29 – Climate Change

- Addresses the question of how the BDCP and its alternatives would affect the resiliency and adaptability of the Plan Area to the effects of climate change.
- Resiliency and adaptability mean the ability of the Plan Area to remain stable or flexibly change as the effects of climate change increase, in order to continue providing water supply of suitable water quality and to support ecosystem conditions that maintain or enhance aquatic and terrestrial plant and animal species.

Chapter 29 is different from other chapters, which identify the effects of actions within BDCP or its alternatives and how to mitigate the effects of those actions. Instead, Chapter 29 looks at how the BDCP or its alternatives perform under future projected conditions due to climate change such as sea-level rise, changes to hydrology, and increased air and water temperatures.

See public Draft EIR/EIS Chapter 29 for the impact analysis and conclusions.

BDCP
Bay Delta Conservation Plan

Transportation, and Public Services and Utilities

Chapter 19 – Transportation

- Examines the transportation systems that serve the study area and the potential effects of BDCP or its alternatives implementation on roadway, marine, rail, and air transportation facilities
- Study area includes the Plan Area and some roadway segments outside the Plan Area that could be affected by construction activities

The analysis focused on the following types of effects:

- Substantial increases in traffic, delays or alteration of current circulation patterns
- Creation of traffic hazards or deterioration of roadways
- Interference with emergency management and evacuation routes
- Disruption of marine, air traffic, or transit service during construction or operations
- Interference with bicycle routes
- Conflicts with adopted policies, plans, or programs supporting alternative transportation (such as bicycles and transit services)

See public Draft EIR/EIS Chapter 19 for the impact analysis and conclusions.

Chapter 20 – Public Services and Utilities

- Describes the potential effects of implementing BDCP or its alternatives on public services such as law enforcement, fire protection and emergency services
- Describes the effects of implementing BDCP or its alternatives on utilities such as solid waste management, water treatment and electricity
- The study area includes the Plan Area

The analysis focused on the following types of effects:

- Need for new or altered public service facilities
- Disruption of existing utility services
- Need for new or expanded water or wastewater treatment facilities
- Need for new or expanded water supply resources
- Exceedance of solid waste management capacity
- Noncompliance with applicable statutes and regulations related to solid waste

See public Draft EIR/EIS Chapter 20 for the impact analysis and conclusions.

BDCP
Bay Delta Conservation Plan

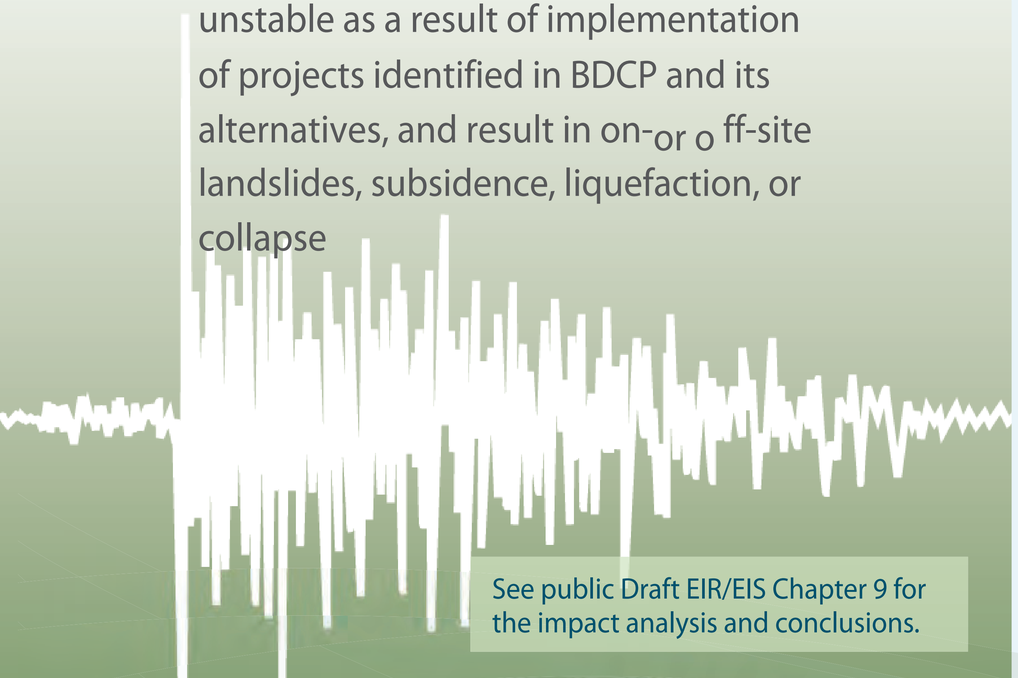
Geology and Seismicity, Soils, and Mineral Resources

Chapter 9 – Geology and Seismicity

- Describes the existing geologic and seismic conditions and associated potential geologic, seismic, and geotechnical hazards in the Plan Area

The types of effects evaluated include:

- Exposure of people or structures to potential substantial adverse effects including risk of loss, injury or death
- Areas that are unstable or could become unstable as a result of implementation of projects identified in BDCP and its alternatives, and result in on- or off-site landslides, subsidence, liquefaction, or collapse



See public Draft EIR/EIS Chapter 9 for the impact analysis and conclusions.

Chapter 10 – Soils

- Describes existing soil conditions that could be affected by implementation of the BDCP or its alternatives

The types of effects evaluated include:

- Accelerated soil erosion from water and wind
- Loss of topsoil caused by excavation, overcovering, and inundation
- Land subsidence due to biological oxidation of peat soils
- Effects of corrosive, expansive and compressible soils

See public Draft EIR/EIS Chapter 10 for the impact analysis and conclusions.

Chapter 26 – Mineral Resources

- Describes existing mineral resources that could be affected by construction, operation, and maintenance of the water conveyance facilities and restoration activities within BDCP and its alternatives

The types of effects evaluated include:

- Loss of known mineral resources of value to the region or the state
- Prevention of access to mineral resources
- Reduction of extraction potential from natural gas fields
- Reduced availability for aggregate resources and sites due to the volume used for construction

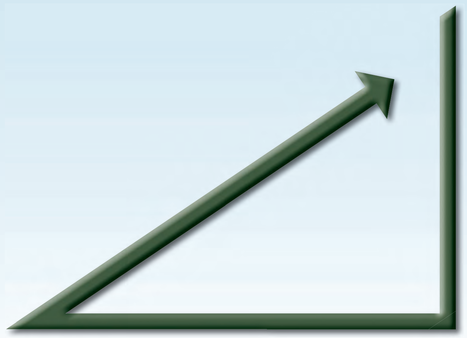
See public Draft EIR/EIS Chapter 26 for the impact analysis and conclusions.

Chapter 30 – Growth Inducement

▶ Addresses the **direct** and **indirect** growth inducement potential of implementing BDCP or its alternatives

Direct effects are caused by the action when the project is occurring, e.g. new jobs.

Direct growth was analyzed by comparing potential new jobs with existing labor force capacity to meet employment demand.



Indirect effects can occur at a later time but are reasonably foreseeable, e.g., land use changes, population density, or growth rate, and effects on air, water, and ecosystems.

Indirect growth was evaluated by projecting the potential of BDCP or its alternatives to stimulate housing development and increase need for public services.

– Potential for growth assessed for consistency with local land use plans

– Considered the relationship between water supply and urban population growth and whether growth would occur without increased water deliveries

See public Draft EIR/EIS Chapter 30 for the impact analysis and conclusions.

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Cultural and Paleontological Resources

Chapter 18 – Cultural Resources

- Assesses the potential effects of implementing BDCP or its alternatives on cultural resources, such as prehistoric and historic archaeological resources, architectural/built-environment resources, and places important to Native Americans and other ethnic groups
- The study area includes the Plan Area

The analysis focused on these effects:

- Ground-disturbing construction that would damage historic or pre-historic sites
- Direct demolition of resources such as historic-era residences or structures
- Direct excavation or alteration of traditional cultural properties
- Direct effects on individual resources, leading to adverse effects on rural historical landscapes
- Potential to alter, directly or indirectly, any of the characteristics of a property that qualifies for inclusion in the National Register of Historic Places

See public Draft EIR/EIS Chapter 18 for the impact analysis and conclusions.

Chapter 27 – Paleontological Resources

- Considers the potential effects on fossils or life history artifacts of prehistoric plants and animals
- Study area includes the Plan Area

The analysis considered if the alternatives would directly or indirectly destroy unique paleontological resources or sites.

See public Draft EIR/EIS Chapter 27 for the impact analysis and conclusions.

Chapter 28 – Environmental Justice

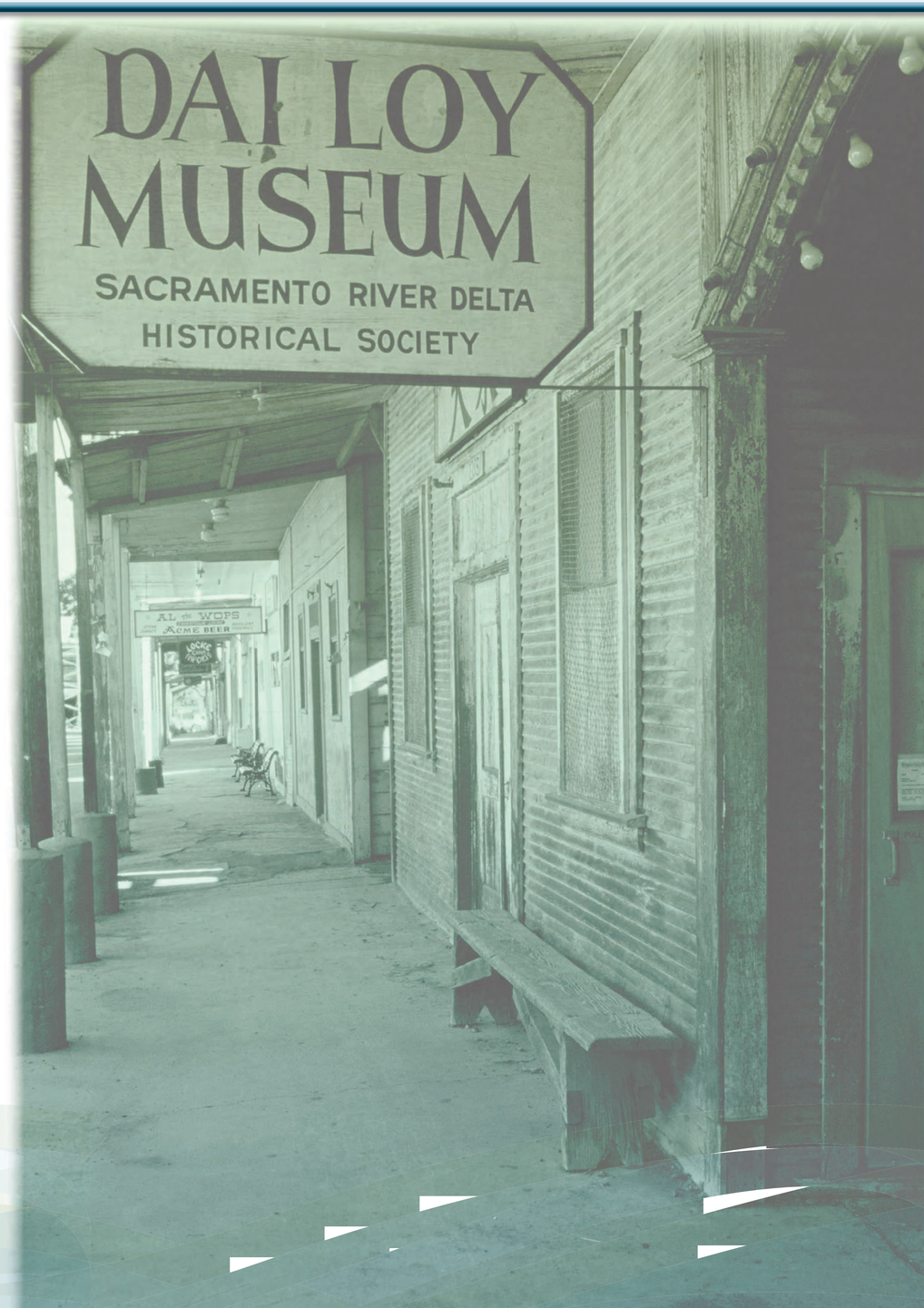
- Addresses the potential for implementation of BDCP or its alternatives to disproportionately affect minority and low-income populations
- Low-income and minority populations in the study area were identified using 2010 U.S. census data

More information on which low-income and minority populations have been identified in the study area is provided in Chapter 28, 28.2.1, Identification of Environmental Justice Populations in the Study Area.

Chapter 28 analysis focused on the following types of impacts:

- Any impact on the natural or physical environment when the minority population is greater than 50% of the population or low-income individuals constitute 20% or more of the population
- Effects that appreciably exceed the adverse impacts on the general population
- Effects that would result in cumulative or multiple adverse exposures to environmental hazards appreciably exceeding the effects on the general population

See public Draft EIR/EIS Chapter 28 for the impact analysis and conclusions.



Pipeline/Tunnel Alignment Alternatives 1A, 2A, 3, 5, 6A, 7, and 8	East Alignment Alternatives 1B, 2B, and 6B	West Alignment Alternatives 1C, 2C, and 6C	Modified Pipeline/Tunnel Alignment Alternative 4	Through Delta/Separate Corridors Option Alternative 9

California Department Of Water Resources
Advancing the Bay Delta Conservation Plan
Delta Habitat Conservation & Conveyance Program
DHCCP Team

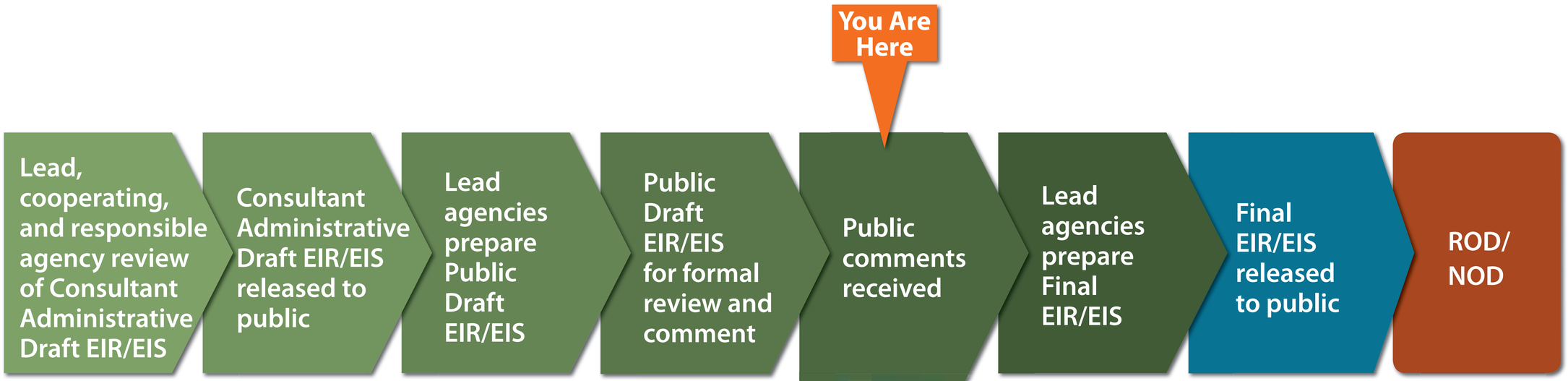
Bay Delta Conservation Plan
Draft Environment Impact Report/Statement (EIR/EIS) Alternatives

* The Alignments displayed correspond to the Chapter 3 Description of Alternatives in the released DRAFT BDCP EIR/EIS.

Source: DHCCP Engineering: PTO, ICF-East, ICFWest (Rev 10c); MPTO (Rev 2b); TD/SCO (Rev 3b)

BDCP
Bay Delta Conservation Plan

Next Steps



Public Draft EIR/EIS process will include:

- Public meetings
- Documents available at local libraries, state and federal offices, and online
- Online information available at BayDeltaConservationPlan.com
- Public comment accepted via e-mail and standard mail
- Landowner liaison to answer questions
- 120-day public review and comment period

BDCP
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How to Comment on Draft BDCP and Associated Draft EIR

FORMAL COMMENT PERIOD: December 13, 2013–April 14, 2014

The Draft BDCP and BDCP Draft EIR/EIS are available to the public for a 120-day review period. Comments must be received electronically or postmarked on or before April 14, 2014.

MAIL TO
BDCP Comments
Ryan Wulff -
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

EMAIL TO
bdcp.comments@noaa.gov

AT A PUBLIC MEETING
You may fill out a comment form or give verbal comments to a court reporter.

Find BDCP Public Draft Documents

- Project website: *BayDeltaConservationPlan.com*
- Libraries throughout the state
- State and Federal Offices

Department of Water Resources
3500 Industrial Blvd., Room 117
West Sacramento, CA 95691

National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Submit Effective Comments

- Be concise
- Focus directly on EIR/EIS analysis
- Identify issues within specific parts of the EIR/EIS
- Include supporting evidence and facts
- Provide complete references and/or citations

View the complete Draft BDCP and Draft EIR/EIS on the website at *www.BayDeltaConservationPlan.com*

BDCP
Bay Delta Conservation Plan

BDCP Statewide Economic Impacts

August 2013

The draft Statewide Economic Impact Study evaluated the economic impacts of the Bay Delta Conservation Plan (BDCP) on various interest groups. While other economic studies completed for the BDCP evaluate benefits and costs to water users, this study by The Brattle Group and ICF International looks at whether the project is a worthwhile investment for the state as a whole. The study indicates that **the BDCP would result in a significant net economic benefit to the State of California**. Adding together impacts to which dollar values could be assigned, the BDCP would result in a net improvement in the economic welfare of California residents of $4.8 billion to $5.4 billion over the 50-year permit term. BDCP also will generate over $84 billion in additional business output in California and almost 1.1 million jobs* over the 50-year life of the plan. These figures take into account the induced economic impacts of increased water rates and taxes associated with the cost of BDCP, and the impact of construction activity and targeted land retirement in the Delta.

Among the study's major findings:

Water Supply Reliability

The largest economic impacts of the BDCP are those associated with improved water supply reliability in California. Without the BDCP, state and federal water project deliveries from the Delta, which provides water for 25 million Californians, can be expected to decline by as much as 40 percent as a result of current and future environmental regulations designed to protect listed species.

The BDCP will stabilize project deliveries at close to levels of the recent past. This improvement in water supply reliability alone would increase California business output by over $73 billion over the permit term and create or preserve up to 1.1 million jobs in the Bay Area, Southern California, the San Joaquin Valley, and the Central Coast. These benefits are evaluated relative to a scenario in which the environmental protections that are part of the BDCP are applied to the existing conveyance and habitat in the Delta.

The BDCP reduces the vulnerability of the state and federal projects to large earthquakes. The new conveyance facilities envisioned as part of the BDCP are capable of delivering up to 80 percent of pre-earthquake water supplies, as compared to roughly 20 percent under the existing infrastructure. This improved level of reliability is valued at nearly half a billion dollars.

Construction of New Conveyance Facilities and Habitat Restoration

The in-Delta construction, restoration and operations carried out under the Plan are expected to create over 177,000 jobs and $11 billion in employee compensation in California over the 50-year permit term. These projects will increase the revenues of California businesses by $29 billion. All of these impacts take into account the effects of land retirement in the Delta to conserve listed species.

**A job is defined as a position equivalent to one full-time worker for a year.*

1.1 million

Number of California jobs associated with improved water supply reliability, construction of new conveyance facilities, and habitat restoration over the 50-year life of the permit

$84 billion

Net increase in statewide economic activity over the 50-year permit term

$29 billion

Increased state business sales as a result of construction and operations of new conveyance facilities and habitat restoration

$11 billion

Total employee compensation expected to be created by in-Delta construction, habitat restoration, and operations

Construction of the new water conveyance facilities alone will create more than 110,000 jobs in California over the 10-year construction period. It will generate nearly $8 billion in employee compensation to California workers. Construction spending for just this portion of the BDCP will increase California business sales by over $21 billion.

Adding together the costs to water users and taxpayers, the BDCP is expected to cost Californians roughly $15 billion. These expenditures increase water rates and taxes, redirecting dollars that could have been spent on other goods and services, and decreasing business activity in California by $19 billion and reducing 102,885 jobs over the 50-year life of the permit.

110,000

Number of jobs created as a result of construction of the new water conveyance facilities.

BDCP Construction Impacts in the Delta

Construction of the new conveyance facilities will cause transportation delays and disruptions on Delta roadways, resulting in additional costs to travelers and local businesses. The total impacts of transportation delays over a 9-year construction period are up to about $80 million in 2012 dollars, including the impact of planned traffic mitigation measures.

Construction and operation of new conveyance facilities, and the restoration of habitat, will increase emissions of pollutants that have been linked to adverse health outcomes. The total economic costs of these air quality impacts in the Delta are estimated to be less than $16 million through the purchase of offset credits that reduce pollution in the same air basin. However, the BDCP will reduce the amount of greenhouse gases emitted in the Delta region, providing a net benefit to the state of as much as half a billion dollars.

Changes in the Delta Environment

Overall, the BDCP will enhance recreational activity in the Delta. Those participating in fishing, hunting, boating, birdwatching, and other recreational activities are expected to gain an additional $200 million to $400 million over the 50-year life of the plan as a result of habitat restoration and other enhancements. These estimated benefits are a measure of what people are willing to pay for their experiences, minus what they actually do pay.

The impact of BDCP on certain properties in the Delta is expected to be negative for properties located near surface structures of the new conveyance facilities, and positive for properties located near areas being protected or restored by the conservation measures. Impacts from construction will be realized primarily during the 9-year construction period, while the benefits on property values of open space created by conservation measures is expected to be permanent.

The BDCP will affect populations of Chinook salmon (the only major commercial fish species in the Delta) by restoring and enhancing floodplains, tidal wetlands, and channel margin habitat in the Delta and Suisun Marsh. Due to the high degree of uncertainty involved in forecasting salmon populations under scenarios with and without the BDCP, these economic impacts are not quantified in dollars. But because BDCP predicts a net positive effect on Chinook populations, the economic effects of BDCP on this fishery are expected to be positive.

Delta Property Values:

\+ Properties located near areas protected and restored by conservation measures

– Properties located near the surface structures of the new conveyance facilities

Salinity

The BDCP is expected to minimally alter the levels of salinity in Delta waterways. State and federal water contractors benefit by roughly $2 billion as a result of reduced salinity of project deliveries.

The BDCP will also affect the salinity of irrigation water used by some Delta farmers. Using a model developed by the Delta Protection Commission, the income losses from increased salinity are projected to be $34 million over 40 years of new water operations, an average annual impact of $850,000.

Implementing the BDCP would substantially increase economic welfare, business activity, and employment in California.

The draft Statewide Economic Impacts Study is available online at **www.BayDeltaConservationPlan.com**.

BDCP
BAY DELTA CONSERVATION PLAN

Your Questions Answered

Your Questions Answered also available at:
www.BayDeltaConservationPlan.com/AboutBDCP/YourQuestionsAnswered.aspx

Construction Impacts

How long will construction take, and how will construction activities impact residents, farming, fisheries, recreation, and other economic activities? What provisions are being made for negative impacts?

Construction of the proposed BDCP water delivery facilities would be sequenced over approximately 10 years. Construction of individual components (e.g. intakes, tunnels) would range from one to six years. Temporary construction-related impacts include noise, visual, and transportation, among others. The construction-related impacts are disclosed in individual resource area chapters in the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS). All impacts would be minimized and mitigated to the degree feasible and are described in the individual resource chapters and in the Environmental Commitments detailed in Chapter 3, Appendix 3B.

What is the total amount of agricultural land in the Delta that will be impacted by construction, including disposal of dirt and material?

A total of approximately 6,600 acres of agricultural land would be impacted by construction for the proposed Bay Delta Conservation Plan (BDCP) water delivery facility described by the preferred Alternative 4. This includes the tunnel material sites. Of this total, at least 1,300 acres would be temporarily affected. For comparison purposes, the 1982 Peripheral Canal plan estimated impacts of approximately 6,600 acres of agricultural land in the Delta, but did not quantify the acreages needed to accommodate the conveyance material. The amount of agricultural land impacted represents 0.8% of total land in the study area (comprised primarily of the Delta, Suisun Marsh, and Yolo Bypass) and 1.1% of total agricultural land. Of the 6,600 acres anticipated to be impacted, approximately 6,300 acres are designated as Important Farmland, while the remaining 300 acres are identified as grazing lands.

Seismic Concerns

How many seismic faults will the proposed tunnels cross? At what depth?

The San Andreas fault system dominates the seismicity of the San Francisco and Bay Delta region, and it comprises several major faults including the San Andreas, Hayward–Rodgers Creek, Calaveras, Concord–Green Valley, and Greenville faults, as well as many inactive faults. In addition to these major faults, many other named and unnamed regional faults accommodate relative motion. The Delta and Suisun Marsh are in the eastern portion of the greater San Francisco Bay region, one of the most seismically active areas in the United States.

State of California mapping shows that the only faults in the BDCP Plan Area capable of surface rupture (i.e., "Alquist-Priolo" faults) are the Green Valley and Cordelia faults. Both faults cross the western corner of the Suisun Marsh Restoration Opportunity Area (ROA).

In addition to the active and inactive faults in the Plan Area that have a surface expression (i.e., a lineament), the Delta is underlain by blind thrusts that are considered active or potentially active, but they are not expected to rupture to the ground surface. Blind thrust fault ruptures generally terminate before they reach the surface. They may produce ground manifestations (i.e., below ground shear zone and/or ground surface bulging) during breaking, but in most cases, no clear surface ruptures.

The tunnel and other water conveyance facilities would be constructed to withstand seismic ground shaking and surface deformation. The Conceptual Engineering Reports for conveyance alignments and construction assumptions, appendix 3, provides details related to facility seismic design criteria.

Figure 9-5 in Chapter 9: Geology and Seismicity of the EIR/EIS depicts the active faults and historical seismicity in the region of the proposed project. Additional information on seismic risks is provided in Appendix 3E: Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies.

Because there's uncertainty about seismic risk, should we do nothing to address it?

Some would argue that because the seismic risk in the Delta is uncertain, there is no need to try to mitigate such an event. To paraphrase this argument: "We don't know when or where an earthquake will strike, we don't know how severe the shaking will be, so why waste so much money fixing the levees to an earthquake-proof standard?" Although the seismic hazard is uncertain, we can quantify that uncertainty to help guide decision making.

For example, according to the Delta Risk Management Strategy report published by DWR in 2009, there is a one percent annual probability that ground shaking will exceed 0.15 g near the western edge of the Delta. This level of ground motion could induce liquefaction in Delta levees, thereby causing a breach. Not knowing when or where an earthquake will strike does not justify inaction.

Is the Delta an active seismic region?

There are no records of an earthquake causing levee failure in the Sacramento-San Joaquin Delta, and long-time residents may never have felt an earthquake. But that does not mean the region is not seismically active. California's roughly 160 years of experience with Delta levees is not enough time to truly understand seismic hazard, and the span of a person's life is essentially meaningless to the issue.

Consider two recent events as an illustration:

- A magnitude 7 earthquake struck Haiti in January 2010, killing over 300,000 people. The previous large earthquake in the region occurred in 1770.
- The 2011 magnitude 9 Tohoku Earthquake generated strong shaking and a deadly tsunami

that devastated Japan. The previous event of this size occurred in 869 AD.

Both of these earthquakes were preceded by similar events hundreds of years prior, long before any living person was born. To characterize seismic hazard based on the experiences of local residents or written history in a place as recently settled as California would be dangerous. Instead, scientists try to understand the hazard by characterizing earthquake faults that might shake a particular site, and then estimating the effects of various earthquake scenarios (i.e., ground shaking, tsunami).

Thorough seismic hazard analyses have been performed in the Delta by highly qualified scientists, and we know with certainty that the Delta has been strongly shaken in the past and will be strongly shaken in the future. We don't know precisely when strong shaking will occur again, but we know it will happen eventually and we can characterize the probability that a certain level of shaking will be exceeded in a particular year. We also know that earthquakes are rare events, and the lack of strong shaking during the existence of the man-made levees and the lifetimes of local residents is not surprising.

Facilities, Operation, and Deliveries

How will gravity move water through the tunnels without intermediate pumps?

The energy loss due to friction through a 40-foot diameter tunnel flowing at 4,500 cubic feet per second (cfs) is about 0.4 ft per mile of tunnel, for a total of about 12 feet over the 30-mile length of the main tunnels. As long as the water surface in the intermediate forebay is at least 12-15 feet higher than the water surface elevation in Clifton Court Forebay, water will flow by gravity and no additional energy will be needed to lift the water from the tunnels into the Forebay. The existing pumps at Banks and Jones Pumping Plants will continue to lift water into their respective canals from the Forebay with no need for additional pumps.

What provisions are proposed for maintaining these tunnels over the life of the project?

The California Department of Water Resources (DWR) has been conducting monitoring and maintenance of existing State Water Project (SWP) facilities and has robust protocols for ensuring safety and durability of the water infrastructure it manages. For the BDCP, DWR is proposing that the tunnels be visually inspected either by personnel or by remotely operated vehicle with camera every 5 years. Instrumentation would also be installed along the length of the tunnels to monitor condition of the facility and differential movement.

What are the anticipated deliveries to State and Federal project contractors in wet, average, and dry years? How many acre-feet are expected to be pumped through the South Delta pumps during those same wet, average, and dry years?

The BDCP would provide an average of 4.7 to 5.6 million acre-feet of water supply in a year (one acre-

foot is about as much water as two California households use each year). This “Early Long Term” estimate is for the year 2025 and is about the same amount of water exported through the Delta right now. Water operations would vary depending on the hydrologic conditions (e.g., water year type, actual Sacramento River flows, fish presence), but would always include a required level of Sacramento River flow passing the intakes before water could be diverted. Under all conditions, operational criteria require gradual ramping up of diversions and do not interfere with major river flows. Analysis of the water supply reliability benefits and estimated annual water deliveries of BDCP are included in Chapter 9. The full range of operational criteria by water year type can be found in Chapter 3: Conservation Strategy, Section 3.4 and the corresponding appendices/tables of the public Draft BDCP. In addition, BDCP Chapter 5: Effects Analysis and associated tables, which provide a comparison of alternatives and anticipated water deliveries.

In addition to "anticipated" water deliveries, what will be the maximum delivery possible if the tunnels are built to the maximum size (9,000 cfs capacity)?

The maximum delivery possible through the new conveyance facilities is 9,000 cfs, as described in the proposed CEQA preferred project Alternative 4 in the draft EIR/EIS. Alternative 4 is a “dual conveyance” alternative that includes continuing some deliveries from existing pumping plants in the south Delta, however the maximum deliveries from the dual conveyance system is limited to permitted capacity. The full range of alternatives and their water delivery capacities can be found in the EIR/EIS Chapter 3: Description of Alternatives.

Does BDCP require reoperation of upstream dams, especially on the Sacramento River?

The BDCP Delta operations do not require the reoperation of Shasta, Trinity, Folsom or any San Joaquin River tributary dams. All of the existing reservoir operation criteria are met with the same frequency as conditions without the BDCP. However, some changes in the seasonal release patterns at Oroville would occur under the BDCP, primarily related to increased spring releases and reduced summer releases. However, this change in reservoir storage release patterns does not affect long-term storage and as with the other reservoirs, does not conflict with existing applicable operational criteria.

Surface Water and Storage

Where will the project store the extra water that comes in wet years?

The BDCP does not propose any new south Delta storage facilities as part of project implementation. The BDCP also does not call for any more water diversions than is authorized by state and federal law, but it does propose to make water deliveries when the water is available, depending on variety of operational considerations, including time of year, Delta water levels, and needs for fish.

With existing Delta regulatory constraints, the existing SWP and Central Valley Project (CVP) storage

south of the Delta is not used to full capacity every year (e.g. San Luis Reservoir). In addition, there are a number of other ways water can be stored south of delta for use. For example, local projects already exist for storage through groundwater banking programs.

The California Natural Resources Agency, California Environmental Protection Agency and the California Department of Food and Agriculture recently released a draft Water Action Plan to identify actions to implement water policy in California. Aimed at providing the foundation for sustainable water resource management, specific actions include expanding water storage capacity.

Why is no nonstructural alternative for achieving habitat and species restoration being considered?

Over the last two decades a number of options have been presented, some structural, some non-structural. The growing consensus is that a structural change is required in order to make real strides towards water supply reliability and ecosystem restoration.

The existing operation of the SWP/CVP pumps in the southern Delta can cause or increase a reversal in river flows, potentially altering salmon migratory patterns and contributing to the decline of sensitive fish species such as the delta smelt. By relocating the main point of water diversion to the north and establishing new operating criteria to improve water volume, timing, turbidity, and salinity, along with other conservation measures, the BDCP would improve native fish migratory patterns and habitat conditions and allow for greater operational flexibility.

To meet the BDCP's co-equal goals of ecosystem restoration and water supply reliability, BDCP's Conservation Measure 1 seeks to modernize the Delta's water facilities and establish operational criteria to balance the needs of the ecosystem with the water supply needs of California. However, the EIR/EIS does include a full evaluation of a No Action/No Project Alternative.

Will the BDCP affect upstream reservoirs or cause "dead pool" conditions?

Modeling shows that the coming decades likely will bring more frequently the kinds of conditions capable of depleting California's major reservoirs. The driver of those conditions is climate change, not the BDCP. The modeling shows that the BDCP would give water project operators more flexibility to avoid "dead pool," a condition in which a reservoir is so low its water cannot drain by gravity through its outlets.

The BDCP would affect upstream reservoir levels at certain times of the year, primarily Lake Oroville, in order to provide flows beneficial to fish. But the conservation plan would not increase the frequency of "dead pool" conditions in upstream reservoirs. The BDCP would not affect upstream water rights or entitlements. It aims to allow the federal and state water projects to deliver more reliable water supplies, in a way less harmful to fish. The plan does not increase the amount of water to which DWR holds water rights or for use as allowed under its contracts.

It is projected that water deliveries from the federal and state water projects under a fully-implemented BDCP would be roughly 10 percent more or less than the average annual amount diverted in the last 20 years.

Can the BDCP Drain the Sacramento River?

Operation of the BDCP water delivery system could not drain the Delta rivers and channels dry. The BDCP only would be permitted to operate with regulatory protections, including river water levels and flow, which would be determined based upon how much water is actually available in the system, the presence of threatened fish species, and water quality standards. More information on the ranges of BDCP water diversions, based on water year types and specific flow criteria, can be found here (on page 3.4-17) and here. Detailed limitations and operational criteria can be found in DWR's State Water Resources Control Board Permit D1641 and additional limitations described in the Federal Endangered Species Section 7 Biological Opinions and take permits.

For more information, watch BDCP Shorts: How Much Water?

Would BDCP Divert More Water from the Delta?

The BDCP dual conveyance proposal (using new north delta intake facilities and reducing pumping at south delta facilities) will result in a similar level of water deliveries as currently permitted. The BDCP would not divert any more water from the Delta than what is authorized under the permits to operate a 9,000 cubic-feet per second (cfs) water delivery facility. For comparison purposes, the existing in-Delta water delivery system is capable of pumping 15,000 cubic-feet per second (cfs), but is often not operated at this capacity due to regulations put in place to protect fish species. In addition its facilities are outdated and more harmful to the ecosystem. The BDCP water deliveries would be operated according to strict rules, as described here (on page 3.4-17) and here. The BDCP anticipates that annual water diversions from the Delta would be within 10 percent of the historic, 20-year average.

For more information, watch BDCP Shorts: How Much Water?

Project Commitments, Regulations, Requirements

In terms of the Draft BDCP and Draft EIR/EIS, what is the difference between mitigation and restoration?

BDCP is required to mitigate the impacts to covered species from its covered actions to comply with section 10 of the federal ESA and provide for the conservation and management of the covered species under the state NCCPA. The BDCP conservation strategy is designed to meet both laws. The BDCP Chapter 8 identifies the funding for BDCP from the participating state and federal contractors and from other sources, such as State Water Bonds and Federal funds (see BDCP Chapter 8, Tables 8-

37 to 8-41). Mitigation required to offset the direct and indirect effects of construction activities and operation of the water facility will be funded by state and federal water contractors. The state and federal water contractors will also share in the costs required for the conservation and management of the covered species. For the purposes of the cost estimate, the costs considered as mitigation for the impacts of facility construction and conservation are listed in the BDCP Chapter 8, Table 8-41 along with the rationale for each mitigation calculation. This Table provides estimates of funding provided by state and federal water contractors for their proportion of restoration based on mitigation for construction of certain covered activities and conservation.

The conservation measures, or portions of conservation measures, funded by public state and federal sources are tied to the statewide public benefits of BDCP. Many of these statewide public benefits are described and quantified in the Draft Statewide Economic Impact Report available on the BDCP website.

The 2014 Water Bond is projected to fund $1.5 billion of BDCP costs, or 6.1% of the total costs. The 2014 water bond would fund portions of the following categories of BDCP actions: habitat restoration, habitat protection, habitat enhancement and management, species and ecosystem monitoring and research, and program administration. These actions have a wide variety of public benefits that are described in the Draft Statewide Economic Impact Report, including benefits to ecosystem services, recreation, greenhouse gas emissions, and others)

If species are not recovering, at what point will the fisheries agencies suspend the "take" permits, and what is the plan for export water deliveries if that occurs?

The BDCP conservation measures include actions to improve flow conditions, increase aquatic food production, restore habitat for covered species, and reduce the adverse effects of many biological and physical stressors on those species. The BDCP also recognizes the considerable uncertainty that exists regarding the understanding of the Delta ecosystem and the likely outcomes of implementing the conservation measures. As a component of the conservation strategy, the adaptive management and monitoring program has been designed to use new information and insight gained during the course of BDCP implementation to develop and potentially implement alternative strategies to achieve the biological goals and objectives. It is possible that some of the conservation measures will not achieve their expected outcomes, while others will produce better results than expected. The adaptive management process describes how changes to the conservation measures may be made in order to improve the effectiveness of the BDCP over time. The Adaptive Management Team will have the primary responsibility for administration of the adaptive management and monitoring program, and will have the primary responsibility for the development of performance measures, effectiveness monitoring and research plans; soliciting independent scientific review; and developing proposals to modify a conservation measure. The recommendations of the Adaptive Management Team will help ensure that the BDCP is implemented according to the conservation measures, “take” permit criteria, and consistent with the Endangered Species Act (ESA) and the Natural Community Conservation Planning Act (NCCPA).

Suspension or revocation of the "take" permits, or portions of permits is possible if the plan is not being properly implemented. Proper implementation means that the conservation measures are being accomplished on a timeline intended under the plan. It also means that the adaptive management program is being followed as the plan intends. If conservation measures are not being implemented as the plan requires, and corrections are not being made to ensure proper implementation, the permitting agencies may have grounds to suspend or revoke the take permits.

In addition, the permitting agencies have the ability to suspend or revoke the permits for a particular covered species where continuation of a permitted activity would jeopardize the continued existence of that species and the impact of the permitted activity on the species has not been remedied in a timely manner.

Where does authority lie to stop a particular BDCP action in response to an emergency or changed circumstance?

The Adaptive Management Team will have primary responsibility for administration of the adaptive management and monitoring program, and will have primary responsibility for the development of performance measures, effectiveness monitoring and research plans; soliciting independent scientific review; and developing proposals to modify a conservation measure. In the event that consensus is not reached, the matter will be elevated to the Authorized Entity Group and the Permit Oversight Group for resolution. If concurrence is not achieved, the dispute will be elevated subject to the dispute review process explained in Chapter 7, Section 7.1.7, Elevation and Review of Implementation Decisions. In addition, Section 6.4.2 of BDCP Chapter 3.6, Adaptive Management, describes the process for developing remedial actions to be taken in response to certain changed circumstances.

Is a Biological Opinion required prior to the release of the Draft BDCP?

A biological opinion is not required prior to the release of the Draft BDCP.

Under Section 7 of the Endangered Species Act (ESA), federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS), as appropriate, prior to taking any agency actions to ensure such actions are not likely to jeopardize species covered under the ESA or result in destruction or adverse modification of critical habitat. At the end of consultation, USFWS and/or NMFS must provide a written statement, called a biological opinion, setting forth an opinion detailing how the agency action affects the species or its critical habitat.

For the BDCP, the USFWS and NMFS must conduct an internal ESA section 7 consultation related to their issuances of incidental take statements to DWR for the BDCP. These federal agencies will coordinate the ESA consultation process and other environmental review processes, such as the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), consistent with federal regulations. In addition, the USFWS and NMFS will consult with the United States Bureau

of Reclamation (Reclamation) to complete biological opinions or a joint biological opinion prior to the issuance of any federal incidental take statement or federal action to carry out the BDCP.

How has the BDCP ensured transparency in its planning?

Since 2006, the BDCP has been developed based on sound science, data gathered from various agencies and experts over many years, input from agencies, stakeholders and independent scientists, and more than 600 public meetings, working group meetings and stakeholder briefings. All of the documents, studies, administrative drafts, and meeting materials– more than 3,000 documents – have been posted online since 2010 in an unprecedented commitment to public access and government transparency.

In 2010, the first administrative draft of the BDCP was released to the public. In 2012, the second administrative draft BDCP and the first administrative draft of the EIR/EIS were released to the public. Since then, the proposed project was significantly revised in response to stakeholder involvement and engineering optimization efforts. In 2013, DWR continued to review proposed alternatives during this drafting process, including the Portfolio Approach. Chapter 3 of the EIR/S describes the alternatives reviewed in the EIR/S and Appendix 3A describes the alternatives considered. The California Natural Resources Agency and the Department of Water Resources believe that the currently proposed conveyance facilities and habitat restoration support the goals of the 2009 Delta Reform Act including the co-equal goals of ecosystem restoration and water reliability. Resources and DWR staff will continue seeking improvements and refinements to the current proposal in order to enhance species benefits and to avoid, reduce or mitigate for negative impacts to people, communities, sensitive species and habitats.

The official public review process for the draft BDCP and EIR/EIS will provide an opportunity for formal public comment on the proposed project and project alternatives. Comments on the public draft will lead to further refinement of the BDCP based on input from cooperating agencies, stakeholders and the public.

Cost and Financing

What do you expect the final cost of water to the contractors will be? What are the current ranges of prices south of the Delta for agricultural water, urban water, and water for oil extraction and/or fracking?

The construction of the water delivery facilities is estimated to cost $16 billion (in undiscounted 2012 dollars), an amount that would be paid for by the state and federal water contractors who rely on Delta exports. The range of costs for water vary widely among contractors south of the Delta. Costs depend on the source of water, transport facilities, energy requirements, among other factors. For the agricultural customers of the CVP, prices range from $100 per acre-foot to more than $400 per acre-foot. The Metropolitan Water District of Southern California, which buys water from the SWP,

estimates that the cost of the BDCP would translate into about $5.00 extra per household, per month in its service area. The final cost of water from the new conveyance facilities would be determined by numerous factors. A number of these significant factors, such as the project yield and allocation of costs, have yet to be determined./

As stated previously, DWR does not monitor whether any SWP and CVP water supplies are used for fracking or oil production.

Is there evidence that irrigators in the southern San Joaquin Valley are willing/able to pay for the water they will receive? Will that change if farmers grow annual crops of lower dollar value that are resilient to annual changes in water supplies?

Agricultural interests in the Central Valley are pursing the BDCP because they believe it has the means to provide them with the highest level of water reliability at the best possible price. Irrigators will know for certain whether or not the BDCP is a wise investment once the planning process is complete, and they can conduct a full business case assessment. That final determination will be based on the yield, reliability and regulatory assurances that make up the selected alternative. Yield and reliability will significantly determine the cost of water associated with the conveyance facility and will be considered in light of existing project yield and reliability deficiencies.

Similarly, annual crop choices are very dynamic. Irrigators make crop choices based on market conditions, water availability and a variety of other factors. Annual crops play an essential role in providing irrigators with the flexibility to respond to water shortages to manage permanent crops as necessary. While annual crop patterns play an essential role in providing irrigators with the flexibility to respond to water shortages (in that lands can be fallowed to shore up the reliability of supplies for permanent crops as the need arises), this flexibility comes at a cost to both consumers and producers.

Climate Adaptation

How will the BDCP protect water supplies in the event of an earthquake or levee failure?

The Bay Delta Conservation Plan seeks to avoid water supply disruption and protect water quality by modernizing and updating California's water delivery facilities to ensure 21st century seismic safety standards. The proposed underground water delivery system would be designed to meet 200-year flood protection and would use the latest seismic criteria and design methodologies to protect against earthquake damage. Also, the design would protect water supplies by building intakes upstream in the north delta, where supplies are less vulnerable to seawater intrusion.

There are more than 1,000 miles of levees in the Delta, acting as dams around dozens of Delta islands. Many of these levees are fragile, and all of them are vulnerable to winter storms, seepage, sea level rise, and earthquakes and pose a significant risk to California's water delivery system. Over time, subsidence has caused the man-made islands in the Delta to sink - some more than 20 feet below sea

level.

The U.S. Geological Survey estimates a 63 percent chance of an earthquake of magnitude 6.7 or greater hitting the San Francisco Bay region in the next 30 years. According to the California Department of Water Resources, the ground motion from an earthquake of that magnitude could cause the flooding of as many as 20 islands at once. Depending on tides and water flows, saltwater from the bay could be drawn deep into the Delta, forcing state and federal water project operators to limit statewide water supplies. Depending on the severity of the damage and other factors, water deliveries could be disrupted for months, or even years. The Bay Delta Conservation Plan aims to protect our economy by preventing this type of catastrophe.

Learn more about how the BDCP reduces risk to statewide water deliveries.

How will the BDCP address the Delta's resiliency and adaptability to the effects of climate change?

The anticipated hydrologic changes due to climate change (increased temperatures and more years of critical dryness, increased water temperatures, changes in precipitation and runoff patterns, sea level rise, and tidal variations) will constrain and challenge future water management practices across the state, with or without BDCP. The state is addressing climate change through strategies and a decision-making framework as outlined in the California Climate Adaptation Strategy and Adaptation Planning Guide. However, no single project and indeed none of the BDCP alternatives would be able to completely counteract all of the impacts of climate change.

The BDCP would help to address the resilience and adaptability of the Delta to climate change through water delivery facilities combined with a range of operational scenarios (collectively CM1), measures focused on the protection, restoration, and enhancement of the Delta ecosystem (CM2—CM11), and measures to reduce other stressors (CM12—CM22). In addition to the added water management flexibility created by new water diversions and operational scenarios, the BDCP would improve habitat, increase food supplies and reduce the effects of other stressors on the Delta ecosystem. By improving and expanding available habitat, the BDCP would increase resilience and adaptability to climate change by making alternative habitat available during periods of high stress, such as very high or low freshwater inflow or very high salinity intrusion. By reducing other stressors on the Delta ecosystem, the BDCP alternatives would also improve the health of the ecosystem and of individual species population, making them stronger and more resilient to the potential variability and extreme conditions caused by climate change.

The BDCP's proposed dual conveyance facilities would allow water to be moved through the Delta when conditions permit, and allow water to be diverted from the Sacramento River in the northern Delta when conditions in the south Delta do not permit diversions from the existing State Water Project and Central Valley Project facilities. The location of the north Delta diversion facility is further inland, making it less vulnerable to salinity intrusion, a potential impact of sea level rise in the future. Even if substantial sea level rise and critically dry upstream conditions were to occur, salinity could be

repelled from this location. By establishing an alternative diversion point for exports, a great deal of water management flexibility is added. This added flexibility would provide more options for adaptively managing the Delta so that conditions can be optimized to provide the greatest benefits across all Delta water uses and habitat conditions.

More information on ways in which the BDCP proposes to improve resiliency and adaptability of the Delta to climate change can be found in Chapter 29 and Appendix 3E of the BDCP EIR/EIS.

Ecosystem, Habitat, and Species

What is the timetable for restoration? How will you know that the BDCP's habitat conservation plan is moving forward successfully?

Habitat restoration will occur over the first 40 years of the 50-year permit term and will be sequenced according to a detailed schedule. The BDCP has requirements to complete certain amounts of restoration in 5-year increments, as well as to stay in "rough proportionality" between impacts to each natural community and the required conservation for that natural community. The 5-year requirements for restoration were designed to ensure the plan will meet this rough proportionality standard.

Conservation measures that address water operations and other stressors will be implemented beginning soon after the take permit is issued. Construction of the proposed conveyance facilities would begin approximately two years after permit issuance and continue for an estimated 9 to 10 years. Operations could begin as early as year 11. Habitat implementation timelines can be found in BDCP Chapter 6: Plan Implementation.

The success of the BDCP conservation measures is guided by more than 200 biological goals and objectives, which will be carefully monitored and adjusted, as necessary, through the Adaptive Management program.

How will the fish screens on the North Delta tunnel intakes differ from the ones on the South Delta pumps?

DWR is developing the designs for the north Delta intakes and fish screens in consultation with state and federal fish and wildlife agencies. Similar to the intake and fish screen used for the Glenn-Colusa Irrigation District intake channel (3,000 cfs) and the Red Bluff Diversion Dam intake (2,500 cfs), the BDCP intakes (3,000 cfs) will be designed as physical barriers to meet modern fish-screening standards mandated by the fisheries agencies.

The current location of the south Delta screens and pumps create a cul-de-sac-like arrangement where fish become easy prey for other fish and birds. In addition, the SWP south Delta screens divert fish to a fish holding facility where they have to be transported by truck and released in another part

of the Delta. This induces a great deal of stress on the fish species. The north Delta screens will allow fish to simply pass by and continue on their migratory journey, eliminating the need for holding tanks or fish-hauling trucks. DWR will, however, periodically assess whether any feasible screening options develop in the future.

Should the South Delta pumps, which will continue to be operated 51% of the time, including during dry years, have new screens? If not, why?

The BDCP intends to move the primary point of diversion to the north Delta to restore more natural flows and reduce reliance on the south Delta facilities.

The existing south delta SWP and CVP facilities cannot be easily modernized. DWR conducted numerous studies that determined new south Delta screens could be more harmful primarily due to their location at the end of dead-end channels, which presents limitations on operations and means that fish collection and trucking will always be necessary. In addition, the dead-end nature of the south Delta intake facilities would cause fish to accumulate in front of the screens and be subject to further predation.

What happens if voters do not approve bond measures? Could conveyance construction begin before restoration funding is secured?

Full funding for habitat restoration is not required before the water conveyance facility can be built and operated. Habitat restoration will occur over the first 40 years of the 50-year permit term. The plan has requirements to complete certain amounts of restoration in 5-year increments, as well as to stay in “rough proportionality” between impacts to each natural community and the required conservation for that natural community. The 5-year requirements for restoration were designed to ensure the plan will meet this rough proportionality standard. So the important metric for restoration is achieving these 5-year targets.

Funding for the first 10 years of restoration can come from a variety of sources, including the participating state and federal water contractors, federal appropriations, state and federal grants, and the water bond. If the water bond doesn’t pass in the first 10 years of the plan, restoration would still occur using other funding sources. Funding from the water bonds is needed to complete restoration by year 40, but they are not needed right away for the plan to be successful.

How would BDCP construction affect sandhill cranes in the Delta?

Two subspecies of sandhill crane commonly winter in the Sacramento-San Joaquin Delta – the greater sandhill crane and the lesser sandhill crane. Greater sandhill cranes breed and nest in Washington, Oregon and far northern California, but roughly 10,000 of the birds spend the winter (September through mid-March) in the Central Valley. Of the greater sandhill cranes that winter in the Central Valley, roughly 2,000 forage and roost in the Delta. On average, about 600 of those birds use Staten

Island per day.

The Bay Delta Conservation Plan includes a proposed underground water conveyance system to carry water from the Sacramento River near Hood under the Delta to the existing pumping plant of the State Water Project 30 miles away. Last July, proponents of the BDCP proposed shifting the route of the dual tunnels away from the Sacramento River and under Staten Island.

The proposed alignment raises concerns that tunnel construction would disturb or harm sandhill cranes on Staten Island. The 9,100-acre island is owned by the non-profit Nature Conservancy and managed under a state-held conservation easement to promote wildlife-friendly agricultural practices and flood management.

The California Department of Water Resources is confident that tunnel construction can be done in such a way as to minimize disturbance to the cranes on Staten Island, and BDCP proponents are committed – and legally obligated – to improve overall conditions for sandhill cranes in the Delta over the 50-year life of the BDCP.

The permanent impact of the tunnels under Staten Island would be about 26 acres taken for access shafts. Last summer, when the proposed alignment was shifted to Staten Island, the potential temporary impacts on the island were estimated to cover about 1,300 acres.

Since July, DWR has worked with federal and state wildlife agencies and advocates for sandhill cranes to find ways to reduce the temporary impacts substantially to meet a performance standard of no net loss of crane use days. Such measures may include reducing the footprint of stored excavated material, storing material excavated for the tunnels on the northern tip of the island where cranes generally do not roost, or moving material off the island entirely. Supplemental feeding of the cranes could also be done by leaving more corn unharvested in Staten Island corn fields. The flooding regimes on the island also could be altered to improve both foraging and roosting conditions for cranes, which prefer to roost in shallow standing water and forage at the edge of water.

Temporary electric transmission lines would be needed during construction at the north and south ends of the island. The BDCP has adopted a performance standard of no net increase in bird strike risk for greater sandhill cranes for the transmission lines. This could be accomplished by installing bird strike diverters, co-locating lines, moving lines, or undergrounding existing lines.

All of these and other measures would help the BDCP meet a performance standard (set by federal and state wildlife agencies) of no net loss of crane use days on Staten Island due to construction.

In the long run, the BDCP must meet the California Natural Community Conservation Planning Act standard of contributing to the recovery of greater sandhill cranes. The plan would protect 7,000 acres of crane-friendly habitat and add 575 acres of roosting habitat to the Delta landscape.

Would the BDCP Benefit All 56 Species It Would Cover?

The BDCP is designed as a Habitat Conservation Plan and Natural Community Conservation Plan, which are regulated by federal and state laws and meant to conserve threatened and endangered species. Made up of 22 individual conservation measures, the BDCP seeks to implement habitat restoration actions to protect and promote recovery for all 56 species it covers. More information on the net beneficial effects for covered species can be found in Chapter 5 (Effects Analysis) and are summarized here.

Water Quality

What is the timetable for the State Water Resources Control board to place and enforce limits on water that can be exported from the Delta so that outflows and water quality will be preserved?

A myriad of restrictions on how much water can be exported from the Delta already exist, and in no foreseeable circumstances will exports from the Delta be unlimited. The State Water Resources Control Board (SWRCB) may place and enforce limits on water rights under its control at any time through a water rights hearing process. Bay-Delta water quality standards that are protective of the estuary exist today, and the SWRCB is currently undergoing a periodic review of the standards. The schedule for the current periodic review can be found on the SWRCB website. The SWRCB is expected to implement most new water quality standards through a water rights hearing, which will not be completed for several years.

Current export limitations and operational criteria for the State Water Project and Central Valley Project can be found in the SWRCB Water Rights Decision 1641, commonly referred to as D-1641, with additional limitations described in the Federal Endangered Species Biological Opinions and take permits.

DWR intends that the BDCP would be implemented to manage flows through the Delta to improve the health of the ecosystem while providing reliable statewide water supplies. In addition, before constructing any new SWP Delta conveyance facility, DWR and the Bureau of Reclamation would need to obtain approval from the SWRCB to divert water at any proposed north delta intakes. The SWRCB would hold a water rights hearing to look at impacts of such a diversion on water rights holders.

State Water Management Portfolio

What is the California Water Action Plan, and how does the BDCP fit into it?

The California Natural Resources Agency, California Environmental Protection Agency and the California Department of Food and Agriculture released a draft Water Action Plan to address water policy in California. Aimed at providing the foundation for sustainable water resource management,

the Plan will be implemented over the next five years in close collaboration with state, federal and local governments, as well as regional agencies, Native American tribes and the public. Specific actions include robust water conservation, increased local and regional self-sufficiency, increased water storage, flood protection, and ecosystem restoration, among others.

The BDCP is one component, among many, of the Water Action Plan. In its efforts to achieve the co-equal goals of water supply reliability and ecosystem restoration, the BDCP, a component of the Delta Stewardship Council's Delta Plan, seeks to protect dozens of species of fish and wildlife in the Delta while also securing reliable water deliveries for two-thirds of California.

The California Water Action Plan recognizes that all Californians have a stake in the future of our state's water resources, and that a series of actions are needed to comprehensively address the water issues before us. Over the next five years, fundamental changes to California's water resource management will be made through the Water Action Plan. More information can be found online in the coming months.

Why can't the BDCP be replaced by desalination?

Desalination, the process of removing salt and other minerals from seawater to make it suitable for drinking or irrigation, is being implemented in several California communities. However, it has not proven viable to secure adequate water supplies to meet California's needs due to high costs and energy demands.

Today, desalination creates an estimated 84,000 acre-feet of potable water a year in the state, mostly through treatment of brackish groundwater, which is less salty and cheaper to treat than sea water. In comparison, the BDCP would secure an estimated 4.7 to 5.2 million acre-feet of water to supply more than 25 million people and 3 million acres of farmland.

Although the BDCP would not increase the overall volume of Delta water exported, it would make the deliveries more predictable and reliable, while restoring an ecosystem in steep decline. Local water agencies will need to invest in additional strategies and technologies, including desalination, to meet future water demand.

The BDCP is one part of a diverse portfolio of strategies needed to meet California's overall water management needs. It is not a substitute for increased commitments to other water supply solutions, including recycling, desalination, water conservation and storage.

To learn more about desalination in California, click here.

Groundwater

Will the BDCP impact private wells in the Delta?

The BDCP EIR/EIS analyzes the impacts to groundwater in the Delta region and concludes that operation of the tunnel would have no impact on existing wells or yields. This is because the conveyance facilities would be located more than 100 feet underground and would not substantially alter groundwater levels in the vicinity. In the event that impacts are determined, specific mitigation measures will be put in place (see consultant draft EIR/EIS Chapter 7, Groundwater for more information) to ensure adequate water supplies to meet existing use/land use plans.

However, it is important to note that the BDCP is still in the early phases of environmental review. A public draft BDCP will be available for public comment in fall 2013. Once the BDCP EIR/EIS is Final and certified (mid-2014), and a specific alignment chosen as the preferred project, construction routes and plans will be developed through to final design. Specific property impacts due to construction/implementation of the BDCP will be carefully evaluated after the Public Draft BDCP comment period and leading up to a final EIR/EIS. Once all public comments have been evaluated and responded to, and a preferred alignment chosen, a Final EIR/EIS will be submitted for certification. At that time, specific plans will be developed to mitigate impacts to landowners on an individual basis. It is DWR's intent to leave impacted landowners "whole" through individual mitigation discussions.

Will the BDCP impact groundwater levels in the Delta?

Limitations on available surface water and the potential impacts of climate change make reliance on groundwater (through conjunctive management) increasingly more important in meeting the state's future water needs. The BDCP EIR/EIS includes an entire chapter on impacts to groundwater. It includes an evaluation of the potential for interaction between the canal alignments and the underlying aquifer system in the Delta Region. During construction, dewatering activities associated with the intakes and the forebay would temporarily lower groundwater levels less than 10 and 20 feet, respectively. During operation, conveyance features are not anticipated to affect groundwater level other than in the vicinity of the new forebays. Mitigation measures are evaluated for each alternative and are described in the EIR/EIS Groundwater chapter.

Will water pumped from the Delta be used for fracking in the Central Valley?

The California Department of Water Resources does not regulate the uses to which State Water Project supply is put.

State constitutional restrictions require the reasonable and beneficial use of water, and state laws require that water pumped from the Delta be put to stipulated beneficial uses. Beneficial uses include agricultural, municipal, and industrial consumptive uses; power production; and in-stream uses including fish protection flows. Fracking presumably would be an "industrial" use of water.

The state Department of Conservation is currently working on fracking regulations and rules passed by the Legislature have been sent to the governor. Through the rule-making process, the state will better

understand how much water is actually used for fracking in California. Voluntary reporting indicates that the use of water for fracking is minimal. The Department of Conservation estimates that statewide, about 270 acre-feet of water per year is used for hydraulic fracture stimulation activities. For comparison's sake, roughly 5.2 million acre-feet of water a year have been diverted from the Delta, on average, over the last 20 years by the federal and state water projects for farms and cities.

The State Water Resources Control Board could modify water permits to balance and protect beneficial uses of water. If the Legislature declared fracking to be unreasonable, it would potentially trigger the State Water Resources Control Board to revise water right permits in such a way as to restrict Delta water from being used for fracking.

Benefits of BDCP

How Can a New Water Diversion Help the Delta?

The BDCP proposes to secure California water supplies and improve the Delta ecosystem by implementing a 9,000 cfs water diversion point in the north Delta, where its operations will provide for improved flows. Constructing new water diversion points in the north Delta with state-of-the-art fish screens and providing a means to transport water supplies under the Delta, rather than through sensitive natural channels, would help maintain reliable water deliveries for two-thirds of California's population while balancing the needs of the Delta ecosystem.

Other

Why are the draft documents so massive?

Admittedly, the Draft BDCP and Draft EIR/EIS are large documents, containing a wealth of information and analyses. However, the combined 34,000 pages reflect seven years of collaboration, response to requests for additional information, careful thought, accumulation of the latest scientific information, and the thorough analyses needed to develop and conduct an environmental review of a project as massively critical as the proposed BDCP. Considering that 25 million people, 3 million acres of productive farmland, and the world's sixth largest economy depend, in part, on water from the Delta.

As such, these draft documents are not "massive" relative to the significance to the state, the comprehensive infrastructure and ecosystem restoration being proposed, nor relative to the numerous competing interests in the Delta and throughout the state. The size of the Draft BDCP and Draft EIR/EIS reflect the unprecedented effort put in to their development and the importance of the proposed BDCP for the state.

BDCP
BAY DELTA CONSERVATION PLAN

In recognition of the significance and size of the Draft BDCP and associated Draft EIR/EIS the state has released preliminary drafts and administrative drafts over the years to give decision makers, agencies, elected officials, and the general public and opportunity to learn about these documents as they were developed. These documents also include chapter summaries, reader guides and numerous technical appendices that provide important details about how chapters were developed, how analyses were conducted, modeling results, data on species, and policy guidance, to name a few.

The public and stakeholders have 120 days to review and comment on the Draft BDCP and Draft EIR/EIS (comments must be submitted by April 14, 2014). A number of useful factsheets and materials are available to help guide readers through these documents and identify topics of interest for further review in the draft documents.

Additionally, public open house meetings are being held throughout the state in January and February to provide an opportunity for the public to learn more about the contents of each document, speak directly to the authors and technical experts, and submit official public comments.

BDCP
BAY DELTA CONSERVATION PLAN

Commenting on the Draft Bay Delta Conservation Plan (BDCP) and Associated Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS)

May 2014

The Draft BDCP and BDCP Draft EIR/EIS are being made available to the public for a 228-day review period[1]. The public review and comment period is effective December 13, 2013 through July 29, 2014.

Draft documents are available to view at:

Department of Water Resources,
3500 Industrial Blvd., Room 117,
West Sacramento, CA 95691

and at:

National Marine Fisheries Service,
650 Capitol Mall, Suite 5-100,
Sacramento, CA 95814

and electronically on the project website at www.BayDeltaConservationPlan.com and at libraries throughout the state. Visit www.BayDeltaConservationPlan.com to find a location near you.

Copies of the documents referenced in the Draft EIR/EIS will be available at the DWR Office at 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691.

How to make effective comments

All comments received on the Draft EIR/EIS will be considered in the Final EIR/EIS and decision-making process. The most effective comments are those that follow the guidelines below:

- Comments should be concise and focus directly on the analysis in the EIR/EIS.
- Comments should identify the specific part of the EIR/EIS at issue and should include supporting evidence and facts.
- The commenter should provide complete references and/or citations, particularly when referring to websites (that is, provide a specific URL address rather than simply citing "DWR website," for example).

The comment period is from December 13, 2013 through July 29, 2014.

Comments must be received electronically or postmarked on or before July 29, 2014.

HOW TO COMMENT:

Mail to
BDCP Comments
Ryan Wulff, National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Email to
BDCP.comments@noaa.gov

Only comments submitted via the methods listed above are considered formal comments.

Statements made to project team members are not considered formal comments. **All comments received on the Draft EIR/EIS will be considered in the Final EIR/EIS and decision-making process.** No final decisions have been made regarding going forward with the BDCP or in selecting an alternative; those decisions will only occur after completion of the CEQA and NEPA processes.

The Draft Implementing Agreement was released on May 30, 2014 for a 60-day public review and comment period through July 29, 2014. More information is available on the project website at www.BayDeltaConservationPlan.com.

[1]The Draft BDCP and Draft EIR/EIS are being made available for public review in accordance with the California Natural Community Conservation Planning Act (NCCPA), Section 10 of the federal Endangered Species Act (ESA), the California Environmental Quality Act (CEQA), and the National Environmental Policy Act (NEPA). The public comment period has been extended to a 228-day comment period. This extension will allow the public more time to review and comment on the public draft documents.

BDCP
Bay Delta Conservation Plan

Incorporating Proven Tunnel Technology and Reuse of Excavated Material

Updated March 2014

Arrowhead Inland Feeder

Hetch-Hetchy/ San Francisco Bay Tunnel

Modern tunnels, such as those proposed for the Bay Delta Conservation Plan (BDCP), rely on highly advanced technology. This advanced technology has proven successful in the design, construction, and operation of tunnels in the United Kingdom, France, Japan, China, Mexico, New York, and California. Currently, the State Water Project (SWP) operates more than 15 miles of tunnels in California.

Proposed Delta tunnels would be excavated using a circular cutterhead that mines through the soil at approximately 150 feet below the surface. While no two tunnel projects are exactly alike, BDCP tunnels, and the specialized contractors building them, would utilize modern technologies developed from past projects with similar features, such as length, depth, diameter, and construction conditions. Water and biodegradable, eco-friendly soil conditioners are mixed with the soils to create a toothpaste-like material that is easily transported to the surface via conveyor belt or rail car. During construction, the excavated material will be tested and evaluated to determine suitability for various reuse options. The process for determining disposal and reuse of excavated materials is described in Appendix 3B of the Draft BDCP Environmental Impact Report/ Environmental Impact Statement.

BDCP is evaluating numerous options for the reuse of excavated tunnel material to reduce local impacts from the proposed construction of water conveyance facilities, and would put the excavated material to beneficial use. Material excavated during construction, often referred to as "tunnel muck" (currently identified as reusable tunnel material), has been identified for many possible reuses, including strengthening levees, raising subsiding Delta islands, restoring natural habitats, and as structural fill associated with construction of conveyance facilities.

No final decisions on the BDCP can be made prior to the completion of environmental review and public input. The elements described here have been identified for the purpose of further analysis pursuant to the California Environmental Quality Act, the National Environmental Policy Act, the Endangered Species Act, the Natural Community Conservation Planning Act, and other applicable statutes.

Uses and Location of Reusable Tunnel Materials

Excavated tunnel material has been successfully reused around the world, and California Department of Water Resources (DWR) recently completed a preliminary laboratory test study to evaluate geotechnical, environmental, and plant suitability properties. The test results indicate that the excavated tunnel materials would be suitable for the proposed beneficial reuses. The Reusable Tunnel Material Testing Report is available at **http://baydeltaconservationplan.com/PlanningProcess/EnvironmentalReview/SupportingTechnicalStudies.aspx**. DWR will consult with relevant governing regulatory agencies to obtain necessary permits prior to actual reuse.

Reuse of excavated tunnel material is expected to reduce impacts to locations within Delta communities previously identified as "tunnel muck disposal sites." As part of the analysis of the refined project, potential reuses have been identified and are listed below:

- Habitat Restoration – Reuse of excavated tunnel material for habitat projects will contribute to the approximately 150,000 acres of habitat restoration and protection identified in the Draft BDCP. Tunnel material may be used to reverse Delta island surface subsidence and to create conditions beneficial to migratory birds, including greater sandhill cranes.
- Levee Improvements/Flood Mitigation – Tunnel material could be used to strengthen Delta levees identified for maintenance and repair.
- Structural Fill – Materials have potential use as structural fill for construction of conveyance facilities.

Case Study – San Francisco Public Utilities Commission

As part of a broad Water System Improvement Program, a 5-mile-long tunnel is under construction beneath the San Francisco Bay to update aging infrastructure transporting water to San Francisco and other parts of the Bay Area. The San Francisco Public Utilities Commission began construction of the tunnel in 2010 with a 15-foot-diameter tunnel boring machine. Of the nearly quarter-million cubic yards of excavated material, more than 98 percent has been reused for restoration of nearby sites, including the United States Fish and Wildlife Service's Bair Island Restoration and restoration of a private quarry site. Tunnel excavation was completed in early 2013, approximately 6 months ahead of schedule, and no excavated material remains at the staging area near the Dumbarton Bridge.

Photo courtesy of San Francisco Public Utilities Commission, Bay Tunnel project.

JOB CREATION & PROTECTION

The Bay Delta Conservation Plan will result in substantial economic benefits to California, including the creation and protection of more than **1 million full-time equivalent jobs** over the project's 50-year implementation period. A full-time equivalent job is defined as one person working full-time for one year.

	WATER FACILITY JOBS	**HABITAT RESTORATION** JOBS
DIRECT *Jobs created for construction and maintenance*	19,973	21,206
INDIRECT *Jobs created by the purchase of materials and equipment*	64,479	-2,454*
INDUCED *Jobs created by purchases made by employees and families*	34,319	17,566

TOTAL WATER FACILITY JOBS	118,772
TOTAL HABITAT RESTORATION JOBS	36,318
TOTAL WATER FACILITY & HABITAT RESTORATION JOBS	155,090

* AFTER ACCOUNTING FOR FARMLAND LOSS

WATER RELIABILITY JOBS

Statewide jobs created and protected due to economic impacts of improved water supply reliability.

= 10,000

980,722

TOTAL BDCP JOBS

1,135,812**

** FOR MORE INFORMATION, REVIEW THE JOB IMPACT ANALYSIS MEMO AVAILABLE ONLINE AT WWW.BAYDELTACONSERVATIONPLAN.COM

DIRECT WATER FACILITY JOBS

The BDCP water facilities will result in 19,973 direct, full-time equivalent jobs.

SACRAMENTO COUNTY

INTAKE 2	804
INTAKE 3	666
INTAKE 5	709
FOREBAY	191
TUNNELS & SHAFTS JOBS	3,429
TOTAL SACRAMENTO COUNTY JOBS	5,799

SAN JOAQUIN COUNTY

TUNNELS & SHAFTS JOBS	5,529
TOTAL SAN JOAQUIN COUNTY JOBS	5,529

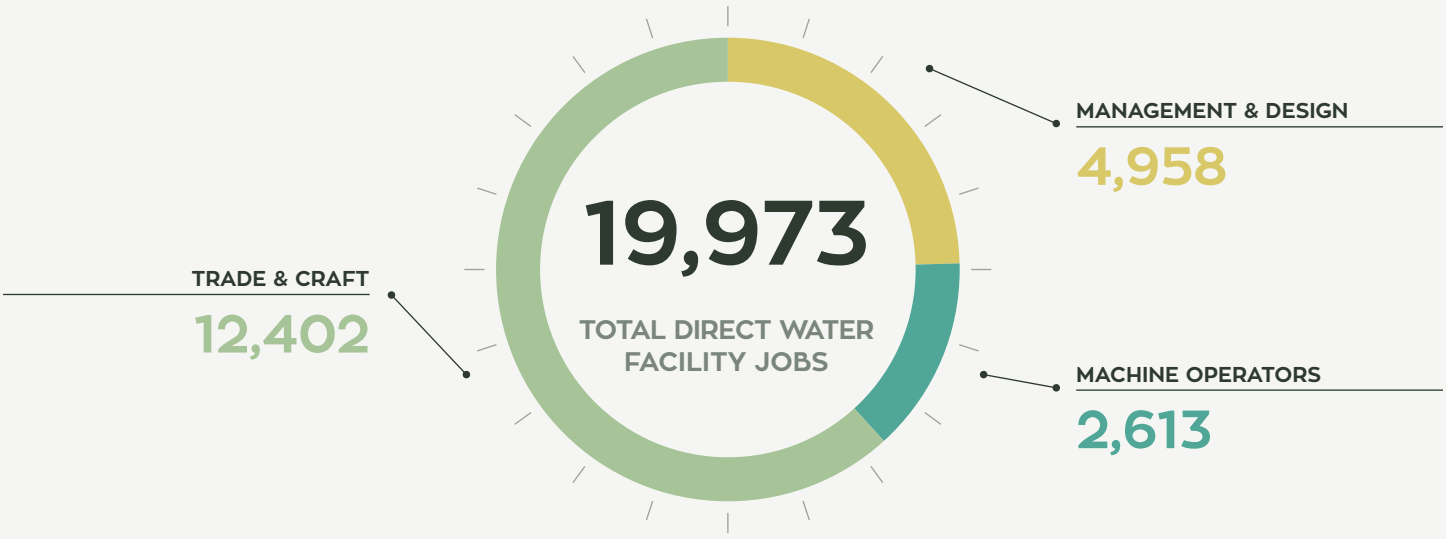
CONTRA COSTA COUNTY

CLIFTON COURT FOREBAY	1,599
TUNNELS & SHAFTS JOBS	1,507
TOTAL CONTRA COSTA COUNTY JOBS	3,106

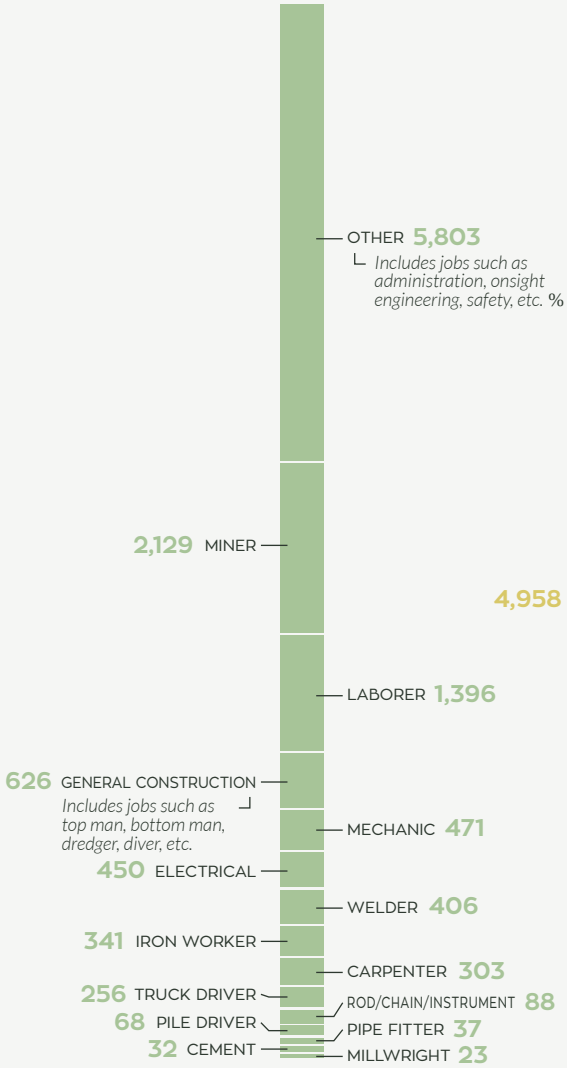
TOTAL ADDITIONAL CONSTRUCTION JOBS ALONG ENTIRE ALIGNMENT	581
DESIGN & MANAGEMENT JOBS	4,958

DIRECT WATER FACILITY JOBS

The BDCP water facilities will generate direct, full-time equivalent jobs in management and design, trade and craft, and machine operator sectors.

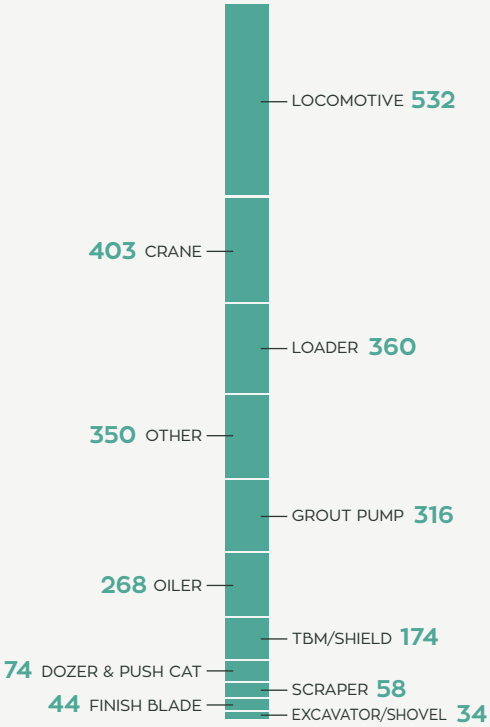


TRADE & CRAFT



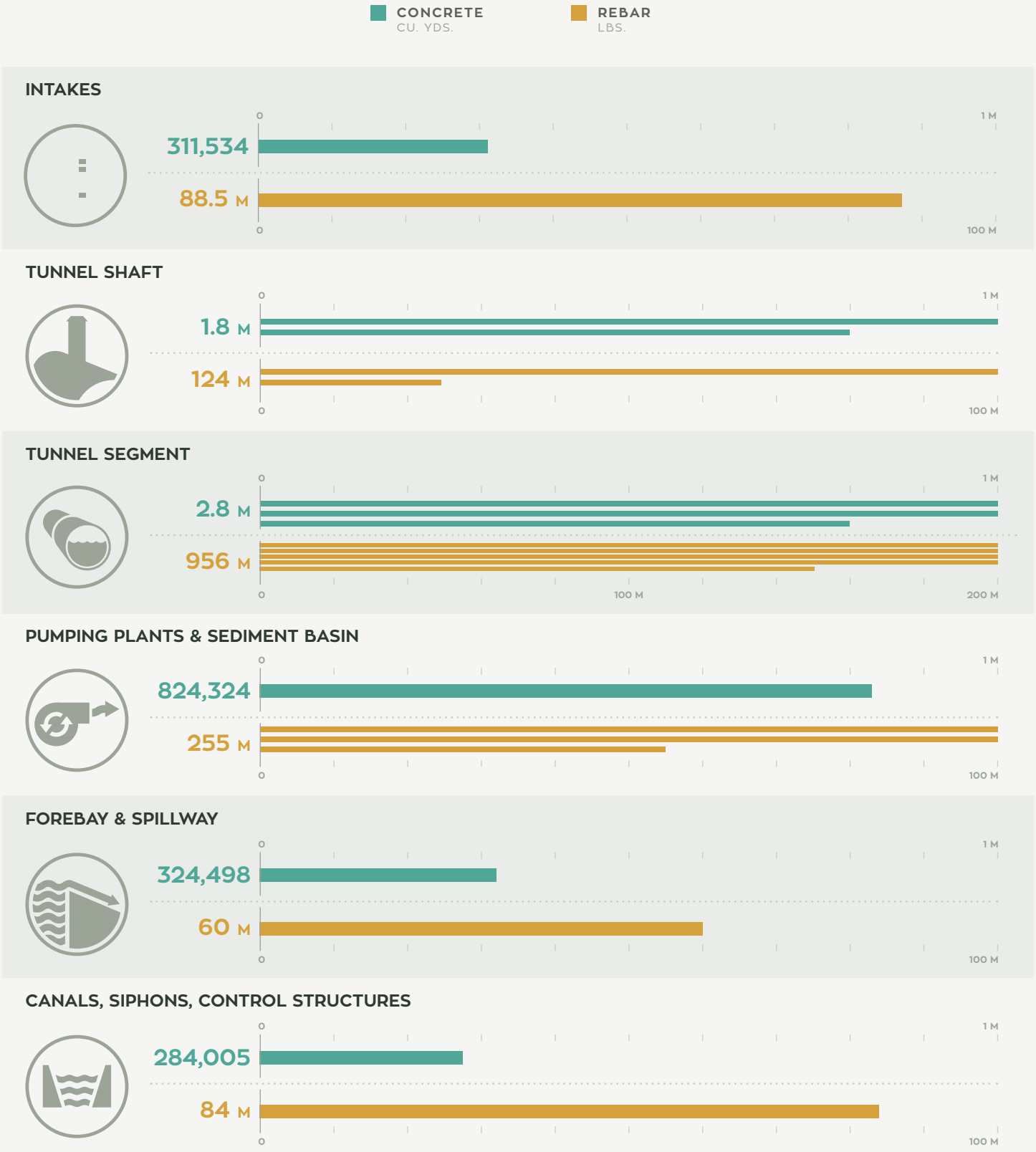
MANAGEMENT & DESIGN

MACHINE OPERATORS



WHAT'S BEING BUILT?

The BDCP will construct **new state-of-the-art water facilities** to move water more efficiently and protect sensitive fish species.



BDCP

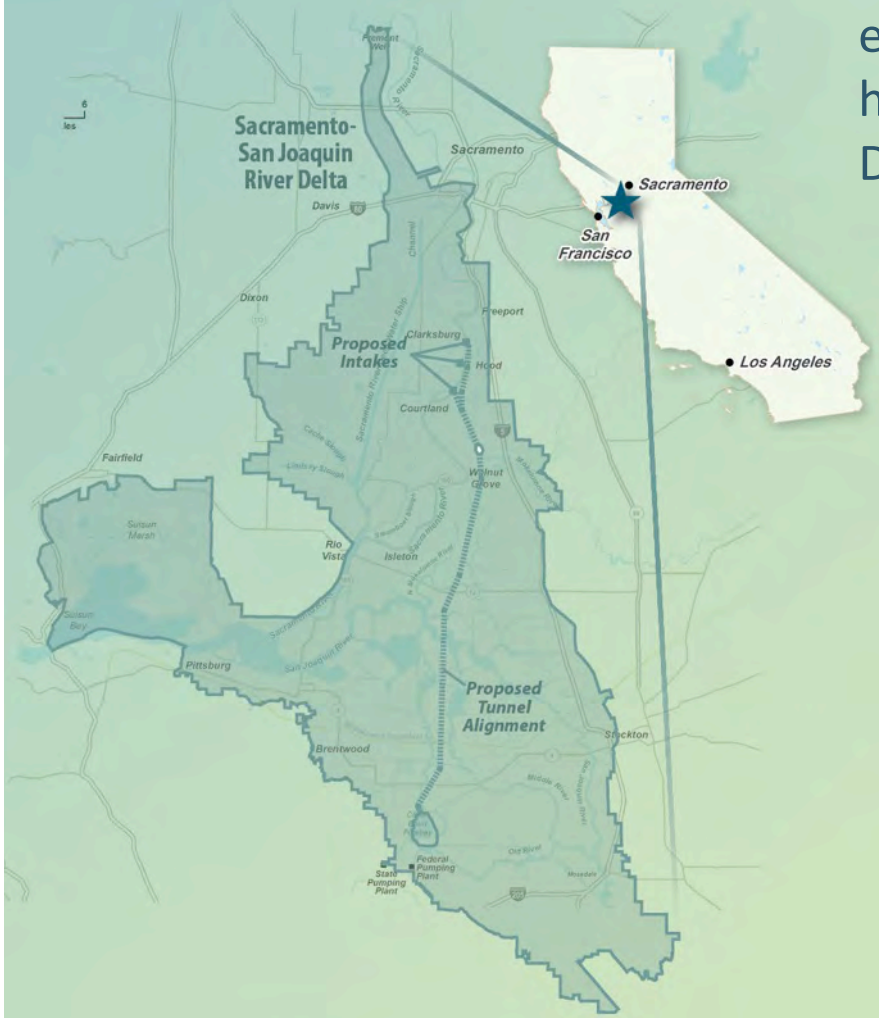
Bay Delta Conservation Plan

Overview Presentation
2014

BDCP
BAY DELTA CONSERVATION PLAN

A Long-Term Strategy…

…To secure California's water supplies, enhance the environment, and restore the health of the Sacramento-San Joaquin River Delta.



The BDCP Co-Equal Goals

WATER SUPPLY RELIABILITY

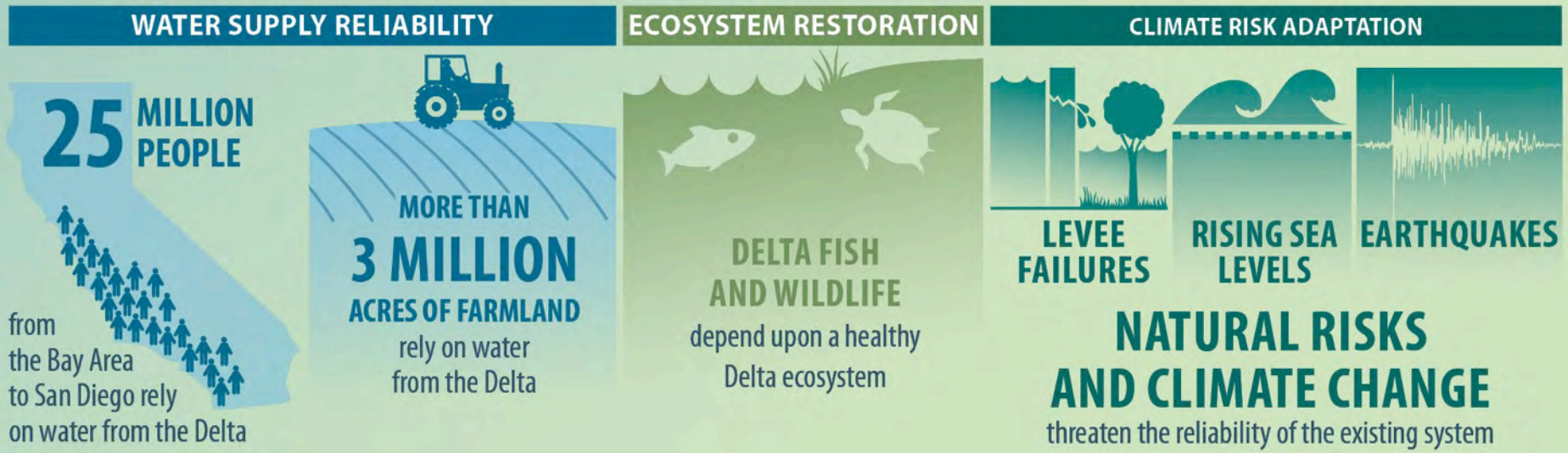
- **3** INTAKES
- **2** GRAVITY FLOW TUNNELS
- **30 MILES** IN LENGTH
- **9,000 CFS*** CAPACITY
  *Cubic Feet per Second

ECOSYSTEM RESTORATION

- **150,000** ACRES OF RESTORED AND PROTECTED HABITAT
- **56** PROTECTED SPECIES
- IMPROVED FLOW CONDITIONS TO BENEFIT FISH IN THE DELTA

BDCP
BAY DELTA CONSERVATION PLAN

The BDCP is Important for California



BDCP
BAY DELTA CONSERVATION PLAN

The BDCP Would Benefit Millions of Californians

The BDCP is one part of California's overall water portfolio. It aims to protect our unique Delta ecosystem and secure water supplies for a vast part of the California economy.

SECURING WATER SUPPLIES

4.7-5.6

MILLION ACRE-FEET ON AVERAGE ANNUALLY

(An acre-foot is roughly as much water as two California households use, indoors and outdoors, in a year)

CREATING & PROTECTING JOBS

1.1 MILLION

FULL-TIME EQUIVALENT JOBS CREATED AND SAVED FOR CALIFORNIA

(Based on a year by year estimate)

BOOSTING THE ECONOMY

$84 BILLION

INCREASE IN STATE ECONOMIC PRODUCTIVITY

BDCP
BAY DELTA CONSERVATION PLAN

The BDCP Would Benefit the Delta Ecosystem

DELTA RESTORATION

BDCP would contribute to the conservation of 56 species of fish, plants, and wildlife in the Delta.

45 

SPECIES OF PLANTS & WILDLIFE CONSERVED
through protection and enhancements in the quantity and quality of habitat in the Delta.

52% 

INCREASE IN PROTECTED LAND
in the Delta

11 

FISH SPECIES BENEFIT,
from an increase in the amount and quality of habitat, food sources, and ecological function of Delta flows. Species include Chinook salmon and delta smelt.

10 

OTHER STRESSOR REDUCTION MEASURES
would reduce adverse effects, such as invasive species, predation, and contaminants, to improve the ecological function of the Delta.

BDCP
BAY DELTA CONSERVATION PLAN

The BDCP is Guided by the Best Available Science

ADAPTIVE MANAGEMENT PROGRAM

to implement and monitor BDCP biological goals and objectives

WATER OPERATIONS

by the Department of Water Resources and the U.S. Bureau of Reclamation

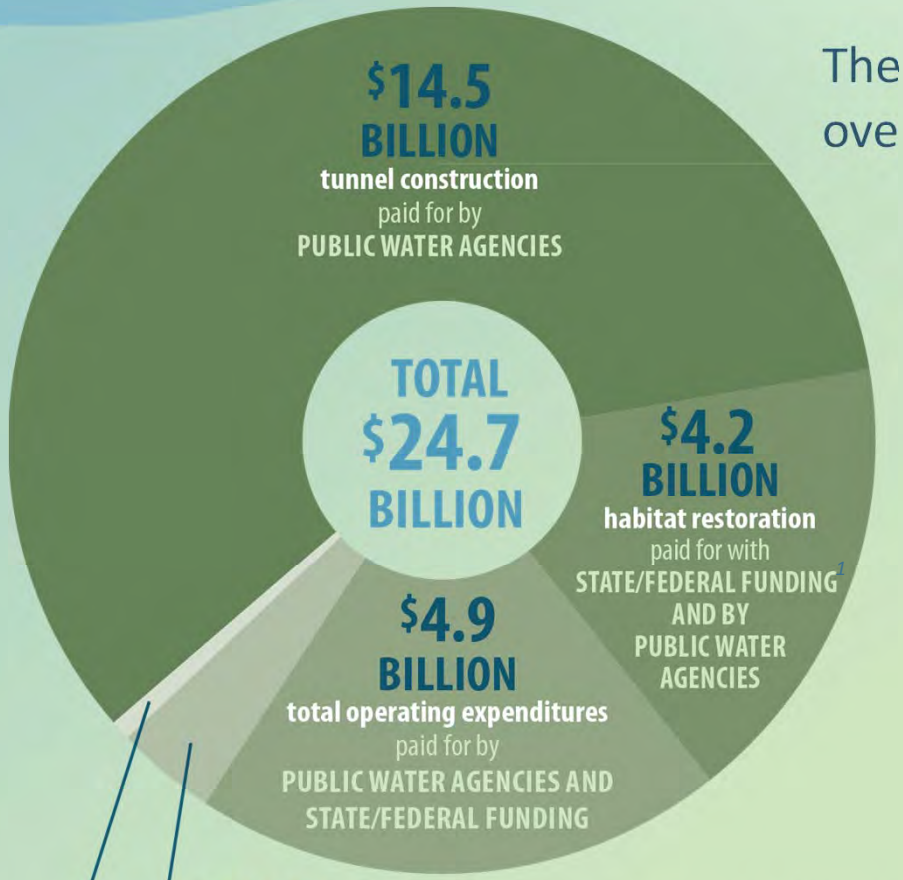
OVERSIGHT

by state and federal fish and wildlife agencies

BDCP
BAY DELTA CONSERVATION PLAN

BDCP Costs and Funding

The BDCP would be implemented over a 50-year period.



$.927 BILLION to address other stressors — paid for by **PUBLIC WATER AGENCIES AND STATE/FEDERAL FUNDING**

$.184 BILLION for monitoring, research, plan administration, and other costs — paid for by **PUBLIC WATER AGENCIES AND STATE/FEDERAL FUNDING**

[1] *The availability of federal funds will be contingent on future federal appropriations.*